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COMPUTERWORLD

BASF tape exchange receives mixed reviews

3480 vendor claims problem almost resolved

BY JOHANNA AMBROSIO
CW STAFF

BEDFORD, Mass. — BASF Corp. is scrambling to replace hundreds of thousands of faulty 3480-class mainframe tape cartridges that deposit a substance that gums up tape drives and may contaminate other cartridges and drives.

The problem came to light as users began to experience a lot of permanent write errors. After a lot of finger-pointing, it was determined that the problem lay with BASF tape cartridges.

BASF Marketing Vice President John Healion said the problem, which has affected hundreds of large customers, lies essentially with the formula for the binding that holds the magnetic particles together on the tape. BASF changed the binding formula in May 1991, but all the cartridges it manufactured before then — 25 million worldwide by some estimates — could manifest the problem. So far, only several million have been found to be faulty.

Healion would not disclose the number of cartridges the company has replaced at this point or how many remain.

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Cartridge conniption

Tapes made by BASF could gum up 3480 drives. Here are the warning signs:

- Debris on read/write heads.
- Inordinate amount of write errors.
- Tape manufactured before May 1991.

IBM, DEC drenched in red ink

Undynamic duo
1991 ended with a thud for DEC and a painful plummet for IBM
(in millions)

	DEC		IBM	
	Revenue	Net income	Revenue	Net income
Q1*	$3,520	$117	$13,545	($1,731)
Q2*	$3,945	($871)**	$14,732	$114
Q3*	$3,293	$28.6	$14,433	$172
Q4*	$3,479	($138)	$22,082	($1,382)**

*Calendar '91 **Includes restructuring charge

Source: Company reports

BY NELL MARGOLIS
and JOHANNA AMBROSIO
CW STAFF

ARMONK, N.Y. — The staggering fourth-quarter losses posted late last week by IBM and Digital Equipment Corp. failed to faze users and analysts who expected the worst and got it.

IBM reported a $1.4 billion fourth-quarter loss on quarterly revenue down 4.2% year-over-year to $22.1 billion. DEC, meanwhile, posted a $138.3 million loss for its fiscal second quarter on revenue of $3.48 billion.

"We're having a bad year ourselves," said Phil Weis, manager of computer services at Toledo, Ohio-based Dana Corp. IBM's devastated 1991 bottom line, he said, "does not affect our purchase plans for them. They're not going to go away any time soon, at least not in the next couple of years. Their stability is not a concern."

At DEC user site London Life Insurance Co. in Ontario, manager of technology architecture Richard L. Krohe was similarly sanguine.

"A good many vendors are having tough times out there, but DEC is a big company and they are well-capitalized," Krohe said. London Life has maintained a large DEC installation since 1987.

Not a huge surprise

Wall Street, too, was not overly alarmed by the losses.

"I'm disappointed — but only mildly," said Ulric Weil, an analyst at Washington, D.C.-based Weil & Associates. "After all, [IBM] wasn't exactly brimming with optimism last month."

At a December conference, IBM's executive committee warned analysts that the unforeseen endurance of the U.S.

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PC PROGRESSION

I486: The new deal in desktop design

BY CAROL HILDEBRAND
and MICHAEL FITZGERALD
CW STAFF

Desktop systems based on Intel Corp.'s 80386 processor family continue to reign as the anointed system under most corporate purchasing standards, but recent trends in the I486 market are leading many Fortune 500 companies to bump the standards bar up to the 486 platform in 1992.

These influential users say that although pricing plays a part in their decision, anticipated future software evolutions that are expected to exploit 486 technology also play a role. Indeed, such is the momentum building behind the 486 as a business-standard platform that it should be in place as the new corporate standard by year's end, analysts said.

"The 486 is already a standard for us, except in laptop environments," said Kevin Maloney, manager of technology planning and office automation support at Pepsi-Cola International, a Somers, N.Y.-based division of Pepsico, Inc. His division has been buying strictly 486 machines since Compaq Computer Corp. announced its Deskpro/M series in September, he said, adding that price incentives on the upgradable M series provided the carrot for the switch.

Prices for the 486, introduced less than two years ago for about $10,000, have dipped to a current low of just under $2,000, a more rapid decline than the 386 platform. For example, 33-MHz 486DX prices fell 37% from December 1990 to December 1991. In contrast, it took more than five years for the price of 386 systems to achieve

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PC by numbers (Average price of desktop system components)

	80386SX	80386DX	I486
Motherboard	$112	$214	$404
Memory	$90	$161	$261
Video	$18	$16	$28
Storage	$361	$404	$547
Total supplemental*	$98	$124	$146
Total	**$679**	**$919**	**$1,386**

*Supplemental includes case, power supply, speaker, keyboard and controller.

Source: International Data Corp.

Patience with CA pricing policies runs short

BY NELL MARGOLIS
CW STAFF

Users, vendors and industry observers agreed last week that the recent software licensing lawsuit filed against Computer Associates International, Inc. by computer services giant Electronic Data Systems Corp. is unlikely to be followed by an immediate flood of users leaving CA.

Long term, however, may be a different story, as users — including outsourcers — weigh other software options while EDS' suit plays out in court.

The multicount suit charges CA with a raft of unfair business practices [CW, Jan. 13].

Many firms already hard-pressed by the recession cannot afford the luxury of going to war with their mission-critical software suppliers, said Jim Dudziak, vice president of operations services at longtime CA user Brush Wellman, Inc. in Cleveland.

"But that won't last forever," said Darwin Deason, chief executive officer of Dallas-based outsourcing vendor Affiliated Computer Services, Inc. Grievances against CA are piling up:

• An upgrade from an IBM Enterprise System/9000 Model 30 to a Model 32, "still air-cooled and under 15 MIPS," translated into a 40% price hike for Brush Wellman. "We're in the middle of a nasty recession in our major markets," Dudziak said, "and here we come dancing in [to our management]

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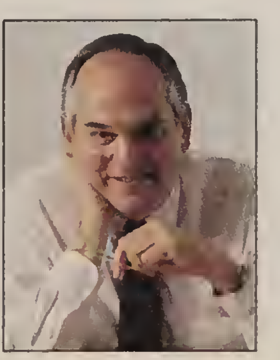

TSC's Bergstein: *Minor furor caused*

NEWSPAPER

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Psst! Wanna know who's gonna win Sunday's Super Bowl? One computer maven claims he already knows the outcome. Page 113.

Low-end workstations from IBM are expected to debut this week. Page 4.

Wellfleet to bundle routers into high-end hubs. Page 4.

Executive Report — IS plays a leading role in the latest competitive weapon: Top-notch customer service. Page 71.

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> *"A lot of vendors are offering what I call the three 'lesses' — diskless, colorless and useless."*
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> *On recently unveiled low-end workstations.*
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Real Programmers hate decaffeinated coffee.

EXECUTIVE BRIEFING

IBM and DEC delivered expected bad financial news last week, with both posting staggering fourth-quarter losses. IBM reported a $1.4 billion loss for the quarter ending Dec. 31, while DEC revealed a $138.3 million loss for the same period. However, customers are going easy on both companies, in part because they, too, have been socked by the recession. **Page 1.**

An IS watcher's report card on IBM's SAA, Repository Manager, AD/Cycle, Systemview and the Information Warehouse gives the firm high marks for ideas but low grades for execution. Perhaps an Olan Mills' IS staffer put it best: "If half of the effort had been put into deliverables as has been put into publicity, maybe we would have something today." **Page 81.**

The danger of obsolescence makes today's laptop PC a good candidate for lease, as some users are discovering. Leasing portables is becoming attractive to users who are worried that they will be left behind the technology curve if they lock in with equipment purchases. **Page 39.**

BASF is replacing thousands of flawed 3480-class tape cartridges that have the potential to cause permanent write errors and disrupt operations. The company says 'hundreds' of large customers are affected. **Page 1.**

Users at the Pen Computer Users Conference want more pen-based products to start shipping this quarter so they can get pilot projects under way. **Page 8.**

Increasingly, companies are building or expanding their IS-backed customer service for use as a competitive tool. IS spending for customer service systems will account for 40% of IS budgets in some sectors, with technologies such as EDI and expert systems drawing high interest. **Page 71.**

The Intel I486 will likely replace the 80386 by year's end as the desktop standard for many users. **Page 1.**

Microsoft plots its groupware strategy. **Page 10.** Meanwhile, Lotus' Notes is finding itself at the heart of long-term groupware plans in several large corporations. **Page 39.**

IBM's Escon will show up at plenty of user sites this year, largely because most new IBM mainframe gear will arrive with Escon support. However, users say they aren't in a great rush to actually use the optical-fiber Escon channels, partly because of the expense involved in buying Escon-compatible peripherals. **Page 29.**

Efforts are under way in the Southeast to use networking to give small manufacturing firms the clout of and access to large companies. Semnet is intended to make it easier for small companies to sell to larger companies and to collaborate with their peers. **Page 59.**

On site this week: The city of Lubbock, Texas, is looking for a competitive advantage with a geographical information system. A city-owned power and water utility competes with a private utility and hopes the new mapping system will bring customers to the city's service. **Page 43.** The computers are kept in the background, but yes, they are playing a key role in the operations of famed auction house Christies. The company, which uses Data General minicomputers and PCs, even hides its auction-floor PCs behind a wood veneer to maintain its aura of old-fashioned reliability. **Page 33.** Hewlett-Packard is dabbling in telecommuting for its sales force and foresees benefits stretching into the hundreds of thousands of dollars per sales representative. HP hopes that cutting down on employee commuting time will reduce turnover, thus minimizing recruiting and training costs while increasing sales performance. **Page 59.**

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Microsoft, Sybase ease system disparities

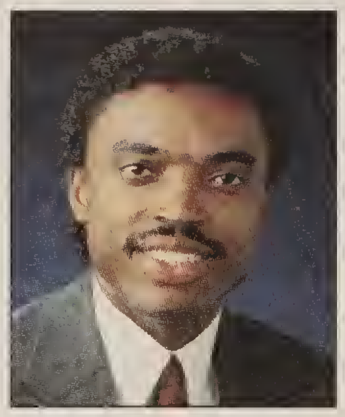
BY JEAN S. BOZMAN
CW STAFF

SAN FRANCISCO — Both Microsoft Corp.'s SQL Server for OS/2 Version 4.2 and Sybase, Inc.'s SQL Server will now be based on the same Sybase software, namely Sybase SQL Server 4.2. This will erase the most glaring of several technical differences between the two vendors' SQL server packages.

The move is expected to boost user interest in SQL Server, which has sold only about 10,000 copies in its three years on the market, despite a major effort launched in July 1991 by Microsoft to pump up sales of the product.

Microsoft and Sybase held a three-day conference here to explain the planned overhaul of the 16-bit SQL Server for OS/2, which had been running a full release behind the Sybase relational database management system for other computer environments.

Executives from both firms also confirmed that Sybase was working on a 32-bit version of the desktop database for Windows New Technology, the 32-bit Microsoft operating system scheduled for shipment by year's end.


Walker says *Microsoft may be willing to resell the Sybase NLM version*

Separately, Sybase will work on a Netware Loadable Module (NLM) version of SQL Server for Novell, Inc. local-area networks.

Stuart Woodring, director of software strategies at Forrester Research, Inc. in Cambridge, Mass., said there is no indication so far that Microsoft would be willing to resell the Sybase NLM version. However, Dwayne Walker, director of marketing and business development at Microsoft, said he has not ruled out that possibility.

Several new products designed to allow SQL Server to operate on an equal level with Sybase servers were also announced by both firms. By the second quarter, Microsoft will ship SQL Server Version 4.2, which will support personal computer clients running Windows, MS-DOS and OS/2, including the forthcoming version of OS/2 2.0.

A developer's kit will cost $1,500, a 10-user system, $3,000 and an unlimited-use system, $8,000. Upgrade packages for current customers will cost $600 for 10 users and $1,600 for unlimited users.

Version 4.2 will be able to access up to 4G bytes of memory — much more than the previous limit of 16M bytes. Support for more than 300 PC clones has been included, Microsoft said.

Also planned is Microsoft SQL Bridge, a Microsoft-developed product that will allow SQL Server to access Sybase databases on other platforms, including Unix workstations and Digital Equipment Corp. VAX machines.

"We have been looking forward to the new release so that we could get that new database administration tool," said Kevin Morton, acting director of the Texas Evaluation and Assessment Management system project at the Texas Department of Mental Health in Austin, Texas.

SQL Solutions Gateway Link, a gateway technology jointly developed by Microsoft and Sybase subsidiary SQL Solutions, Inc. in Burlington, Mass., will allow SQL Server users to access a variety other relational databases.

Microsoft also unveiled SQL Server Programmers' Toolkits, which are based on several programming systems.

Several standard Sybase features have now been added to SQL Server.

IBM RS/6000 to break $10,000 mark

BY MARYFRAN JOHNSON
CW STAFF

SAN FRANCISCO — IBM makes its big splash in the crowded pool of low-end Unix workstations this week with the unveiling of a trio of new models in the $5,000 to $10,000 price range. IBM's current low-end Unix workstation costs $14,000.

The computer giant is also expected to unveil two midrange RISC System/6000 workstations and a new high-end reduced instruction set computing (RISC) model designed to challenge rival Hewlett-Packard Co.'s highest price/performance ratings, according to sources briefed by IBM.

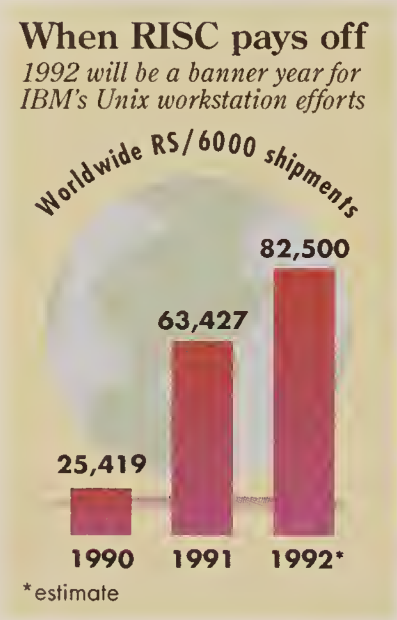
A new version of IBM's Unix-based operating system, AIX 3.2, will also be introduced. It will add a host of functions and features, including improved relational database performance, system management and support of diskless workstations and personal computers, aimed squarely at commercial customers. A price increase for high-end systems will accompany this release, but sources said no price hike is expected on the low end.

"This is very clearly a substantial release of AIX," said one RS/6000 customer who was briefed by IBM.

The least expensive version of the low-end Model 220 reportedly starts as low as $4,195, although sources close to the company stressed that price covers only the system unit. A usable configuration of the 33-MHz workstation, with 16M bytes of memory and 25 to 30 Specmarks in performance, is expected to cost more than $6,000.

Hitting a price point close to that $5,000 mark has become a marketing necessity in the Unix workstation world. Yet industry analysts noted that recent low-end workstation introductions from HP and Digital Equipment Corp. actually require infusions of additional disk and memory to create useful systems.

"A lot of vendors are offering what I call the three 'lesses' — diskless, colorless and useless," said Charles Foundyller, president of Daratech, Inc. in Cambridge, Mass.



Source: Computer Intelligence/Infocorp
CW Chart: Janell Genovese

A color version of the RS/6000 Model 220 will reportedly cost $9,995 and include a 440M-byte disk drive, 18-in. color monitor and 16M bytes of memory. The midrange additions run at 33-MHz and 41.6-MHz clock speeds, respectively.

The high-end Model 560, priced at $57,500, runs at 50-MHz with a Specmark rating of 89.3, according to sources briefed by IBM.

"IBM is clearly playing HP's game," said Bob Tipton, president of R S Tipton, Inc. in Denver, a technical consulting firm for the IBM midrange and RS/6000. "It's also clear that [the RS/6000 development team] in Austin, Texas, is building a machine that will go after commercial transaction processing business in a big way."

Good with the bad

Some commercial customers have already noticed improvements in system software support, yet there are lingering problems with maintenance and field service expertise.

"When an RS/6000 goes down in a commercial application, it can have the same impact as if a mainframe goes down," said Robert E. Matthews, senior vice president at Equitable Real Estate Investment Management, Inc. in Atlanta, which runs a network of more than 20 RS/6000s.

Lagging behind the leading edge in price/performance has also cost IBM some business. At Allied-Signal Aerospace Co. in Tucson, Ariz., a half-dozen RS/6000s are now outnumbered by 37 HP 9000 Model 720s.

"It's definitely the price/performance of the 720s, but also the fact that HP doesn't load up on peripherals that only work on their machines," said Bill Daugherty, a system manager at Allied-Signal.

Even so, IBM managed to gain 5% more share in the Unix workstation market last year, according to preliminary figures from Dataquest, Inc. That gain probably came at the expense of Sun Microsystems, Inc., HP and DEC, which each grew only slightly in market share, said Rikki Kirzner, an analyst at Dataquest. "We expect to see continued aggressive posturing and positioning from IBM," she said.

Wellfleet connecting with smart-hub wiring vendors

BY JOANIE M. WEXLER
CW STAFF

BEDFORD, Mass. — Determined not to leave business opportunities prey to others invading the multiprotocol routing market, Wellfleet Communications, Inc. is cutting deals to bundle its internetworking technology into high-end wiring hubs and other products.

Wellfleet will reportedly first hook up with Bytex Corp., maker of the Maestro switching hub. The relationship will be announced at next week's Communication Networks Conference and Exposition '92 in Washington, D.C., Wellfleet said. Bytex said it has shipped more than 100 Maestros since last August's initial rollout.

"Consolidating bridging and routing technology into our Bytex gear is important," said Jim Haney, director of information systems at Whirlpool Financial Corp. in Benton Harbor, Mich. "Knowing the [Wellfleet] relationship was on Bytex's plate is one reason we chose their hub."

Haney said he intends to replace his Novell, Inc. bridge software with in-hub bridge or router cards.

One step further

Wellfleet will reportedly advance the router-in-a-hub precedent set by archrival Cisco Systems, Inc. by offering network connection choices. Cisco currently offers just two Ethernet options and no Token Ring support.

A series of planned Wellfleet relationships would challenge Cisco, which currently makes hub modules that are "low-end, slow-moving routers aimed primarily at segmenting Ethernets," noted Mary Modahl, director of network strategy research at Cambridge, Mass.-based Forrester Research, Inc.

The Wellfleet modules, on the other hand, will be a two-board system consisting of a processor board into which users can plug several combinations of network connections. The high-end cards will initially sport Wellfleet's existing 68030-based router technology, though "there might be applications in the future" to incorporate the vendor's 1G bit/sec. backplane architecture, due to ship in March, said Wellfleet President Paul Severino.

Another Wellfleet hub deal is said to be pending with Cabletron Systems, Inc., though neither vendor would confirm it. "We have lots of customers looking for more capabilities to route among various network architectures," said Chris Oliver, Cabletron's director of manufacturing and engineering. He said Cabletron will "work with leading router vendors to do it."

Getting Wellfleet technology marketed through additional channels is key to the vendor, particularly with bigwigs such as IBM entering the multiprotocol router arena.

"Wellfleet is facing market realities," said Charlie Robbins, director of communications research at Aberdeen Group, a Boston consultancy. He said Cisco has taken the tack of "offering their technology to everyone" through its diverse marketing channels. "Wellfleet has now identified some fertile fields at the high end of the market. They were leaving a lot of opportunities on the table," he said.

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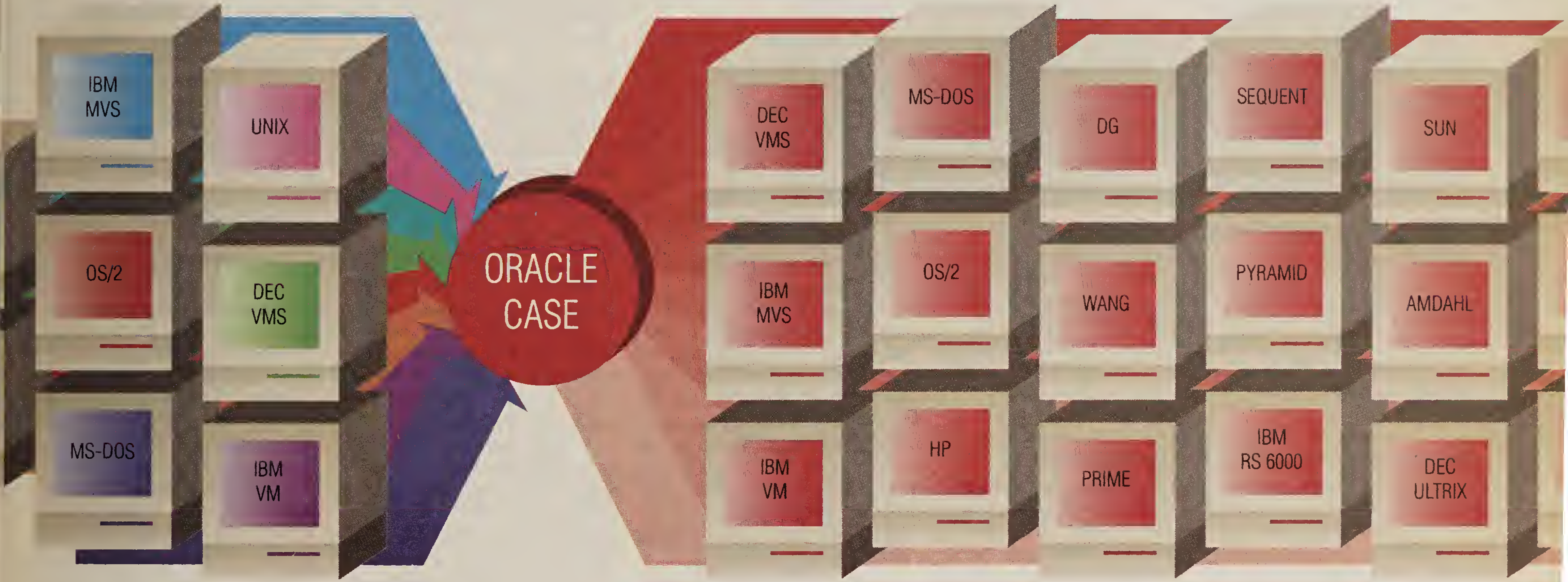

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NEWS SHORTS

FCC addresses wireless LANs

The Federal Communications Commission last week proposed to dedicate 220 MHz of radio spectrum to emerging technologies such as wireless local-area networks and advanced new mobile telephones. The plan is opposed by current users of those frequencies, who would be displaced to other frequencies. The plan is a step in a direction urged by Apple Computer, Inc. and others, which want 40 MHz set aside just for wireless data LANs. A schedule for moving existing users off the earmarked frequencies has not been set.

……

Knowledgeware out of the hole

Knowledgeware, Inc. is expected to report this week a 4% to 11% increase in sales for 1992's fiscal second quarter vs. the same period last year. The company anticipates $31 million to $33 million in revenue for the period ended Dec. 31, up slightly from $29.7 million in the same quarter a year ago. The Atlanta-based computer-aided software engineering firm also said it will turn around the $4.9 million loss reported in its 1992 first fiscal quarter. Cost-cutting measures included a layoff two months ago of 20% of its 900-member work force.

……

Solbourne to lay off 100-plus

The harsh realities of competition in the low-end Unix workstation market caught up with Solbourne Computer, Inc. last week in a restructuring that will cut more than 100 employees, halt desktop development efforts and refocus the company on its Unix multiprocessor server business. Technical service and support for Solbourne's installed base of 5,000 systems will be unaffected by the restructuring, according to a spokesman for the Longmont, Colo.-based company.

……

NCR picks wireless integrator

NCR Corp. said last week it will use systems integrator Alpha Net to provide network services for installing and engineering radio-based data communications. The Dayton, Ohio-based division of Krug International will supply such things as topographical studies for the installation and certification of wireless networks for NCR customers as part of NCR's total systems integration solution.

……

Tandy woes continue unabated

Tandy Corp. warned that it will post a 20% drop in first-quarter sales and revenue this week vs. the same period last year; it is the firm's fifth straight quarter of earnings slides. Tandy said it is preparing to file for an underwritten stock offering of $400 million of preferred shares, subject to approval by the company's board.

……

Systems Center answers IBM

Next week at Communication Networks Conference and Exposition '92, Systems Center, Inc. is expected to announce OS/2 workstation software that uses IBM's Presentation Manager and Common User Access protocols to manage both IBM's OS/2 LAN Server and Microsoft's LAN Manager. Also on tap is software that allows Systems Center's Net/Master to accept the same alerts that Novell, Inc. Netware LANs can now send to Netview; a graphics user interface for Net/Master, a rival of IBM's Netview; and plans for a series of multivendor Net/Master applications, slated for midyear release.

……

DEC to sell Cray supercomputers

Cray Research, Inc. has granted Digital Equipment Corp. the worldwide rights to market, sell and distribute Cray's Y-MP EL supercomputing systems. The Y-MP EL system is an air-cooled, entry-level supercomputer series. DEC sales of the system will begin immediately. DEC announced that it will price the supercomputer starting at under $350,000. Also, press reports last week said Cray will announce a plan next month to use DEC's Alpha chip to power its latest line of massively parallel supercomputers.

More news shorts on page 111

Storage Tek Iceberg edges near

Disk array may give IS managers a less costly way to store their data

BY JEAN S. BOZMAN
CW STAFF

LOUISVILLE, Colo. — Storage Technology Corp.'s formal entry next week into redundant arrays of inexpensive disks (RAID) for data centers could eventually give information systems managers a less costly way to store and back up large amounts of data — and consume less space in doing so.

Getting the 1.6G-byte RAID installed, however, will take some time. Beta testing of the RAID, called Iceberg, has been delayed until the second quarter. Users who have not yet ordered Iceberg will have to stand in line behind dozens of others who have already signed up. Industry analysts said the first year's production of Iceberg, estimated at several hundred units, is already sold out.

However, some IS managers have decided to wait it out. They said they want to see Iceberg's reliability proven in beta-test sites. "We were one of the pioneers in the use of Storage Tek's automated tape library," said Keith Crawford, manager of computer operations at Deere & Co. in Moline, Ill. "But we're going to watch what happens in the marketplace with these."

Storage Tek, too, can afford to wait — a little. Prime competitors IBM and Fujitsu Ltd. are said to still be developing competing RAID devices (see story below). Only EMC Corp., a small Hopkinton, Mass., company, has a head start on Storage Tek. It recently unveiled a second-generation IBM 3990-compatible RAID subsystem with a capacity of 40G bytes [CW, Jan. 13].

Iceberg is supposed to deliver fault-tolerant disk storage at a price of $10 to $12 per megabyte, including the price of the disk controller. IBM 3990 subsystems go for about $15 per megabyte, analysts said.

"You get more gigabytes per square foot of floor space with the RAID drives," noted Jim Porter, president of Disk/Trend, Inc., a Mountain View, Calif., research firm.

Iceberg is a combination of Hewlett-Packard Co. 5¼-in. disk drives and a Storage Tek-designed controller, said Robert Callery, a senior analyst at Technology Investment Strategies Corp. in Framingham, Mass. Software, amounting to about 100,000 lines of code, tells Iceberg on which drive data is stored and how to recover data should one of the drives fail.

Recovery on the fly

The advantage of RAID for data center users is that large volumes of data can be backed up for recovery on the fly. "Iceberg presents the first image of virtual disk in the marketplace," explained Paul Wolfstaetter, a Gartner Group, Inc. analyst. "That way, you only allocate disk space that is in use."

Normal IBM 3380 and IBM 3390 disk drives allocate more space than is used, which then must be compressed to regain usable blocks of disk space.

Robert Costain, corporate vice president of systems development at Storage Tek, said the disk array surpasses the RAID-5 specifications originally designed by computer scientists at the University of California at Berkeley. RAID-5 software entails a complex series of software steps that read, modify and rewrite data on the disks. But the process, which ensures that data will not be lost, imposes an amount of system overhead that can slow overall performance, analysts said. Many call that the "write" penalty.

"Iceberg achieves the fault tolerance of a RAID design, but we have found a way to get out from under the 'write' penalties caused by RAID's error-detection features," Costain said.

IBM users should have little problem accommodating the RAID devices in their existing operating environment, Costain said. "This device looks to the IBM mainframe like an IBM disk drive and controller," he said.

Barring any major manufacturing or operational flaws, RAIDs could become standard features of many data centers by 1995. "I think Iceberg is going to be very influential," Porter said.

Iceberg will, at first, be available only for IBM machines; later versions may be ported to other types of host computers, analysts said. In all, Storage Tek spent more than $100 million during the past five years to develop Iceberg.

Industry analysts said they believe $1.14 billion Storage Tek would like to double its revenue during the next few years, fueled by Iceberg sales and by an upgrade to the approximately 3,700 automated tape libaries the firm installed at 500 customer sites.

'Don't feel sorry for IBM'

IBM may not have a general-purpose disk array of its own for at least 18 months, but customers can look forward to price cuts that will make its existing generation of IBM direct-access storage devices even more attractive, analysts contend.

"IBM's biggest problem from [Storage Tek's] Iceberg [disk array] in 1992 will be one of image. IBM has always owned the reference model for storage devices, and now Storage Technology will do that for a while," noted David Vellante, an analyst at International Data Corp. in Framingham, Mass.

During 1993, Iceberg will gain market share "at the expense of IBM," he predicted, adding that he expects IBM to deliver its own disk-array device in 1994.

IBM is about half finished with its general-purpose disk array, observers said. It will complement the 9570, a RAID-3 device IBM introduced in September for the scientific market.

IBM might have been finished sooner, analysts said, but there have been significant changes in its storage business, most notably its move to become an independent unit in December. Heading up Storage Products is General Manager Ray AbuZayyad, who had been head of IBM's Rolm unit but returned to the storage area in July 1990.

At that time, IBM combined midrange and high-end storage products into one organization based in San Jose, Calif.

"Don't feel sorry for IBM," said James Porter, president of Disk/Trend, Inc., a market research firm in Mountain View, Calif. "They're a year or two behind Storage Tek in disk array, but storage is not one of IBM's problem areas. Look for a lot of activity out there."

In the meantime, Porter said, "IBM will bluff with the FUD factor, like it did when Storage Tek introduced its optical library."

IBM did not return calls to discuss its disk-array plans for commercial data centers.

JOHANNA AMBROSIO

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Itching to put pen to computer

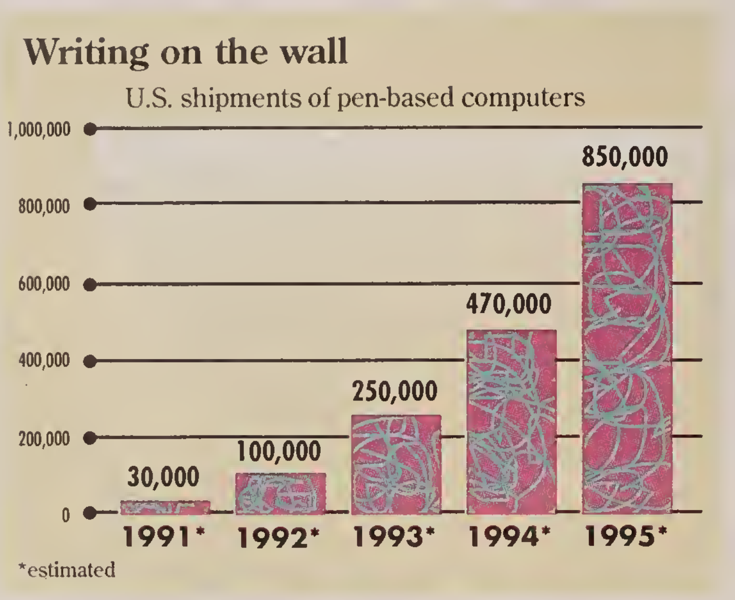
Users say they're primed but waiting for hardware options to materialize

BY MICHAEL FITZGERALD
CW STAFF

BALTIMORE — Poqet Computer Corp.'s Richard Lull jokingly told reporters that the company's new Poqetpad pen-based system would ship "on the first . . . first chance we get."

Poqetpad will ship next month (see story at right), but the question was no joke to users here at the first Pen Computer Users Conference. Grid Systems Corp.'s 2-year-old Gridpad remains the only pen-based product shipping, but it will likely be joined this quarter by products from NCR Corp., Momenta Corp. and others.

Actual products will be a welcome sight for users such as Melvin Hinton, senior engineer at Public Service Electric and Gas Co. (PSE&G) in Hackensack, N.J. Hinton and a team of PSE&G workers have been investigating pen computing since January 1991, and they want to start a pilot project automating forms used by meter readers in the third quarter of this year.


Writing on the wall

U.S. shipments of pen-based computers

Source: IDC

CW Chart: Janell Genovese

Hinton said he was particularly upset by NCR, which promised to ship its System 3125 notepad in September but only received clearance from the Federal Communications Commission last week.

Users at the conference generally agreed that a timetable in which vendors ship products this quarter will work for their pilot plans. "We've already decided [pen-based computing] would be good for us," said Joseph W. King, assistant vice president of Continental Insurance's office and information systems in Neptune, N.J. King said the firm's sales representatives had used notebooks but only with "mixed" success.

"They end up doing a lot of stuff back at their hotel rooms, and we want them to have the ability to do [everything] while at the client's," King said.

Users also said pen-based systems still lack standard software, data integrity, security, proven communications facilities, durability and handwriting-recognition accuracy.

Proverbial penfest

Attendees at the Pen Computer Users Conference were treated to a potpourri of product activity.

Poqet Computer, the Fujitsu Ltd.-backed maker of 1-pound, DOS-based portable computers, entered the pen-based market with a 1.2-pound, XT-class machine called Poqetpad, while Grid Systems, the oldest player in the U.S. pen-based market, was heavily involved in action behind the scenes.

Users at the conference were lukewarm toward the Poqetpad. "I want a 386-based system with a Video Graphics Array screen," said Ray Gregory, manager of personal computing at Scrivner, Inc. in Oklahoma City.

Analysts, though, said they think the Poqetpad might generate sales in the marketplace, particularly as the smallest entry currently available.

Poqet's machine, expected to ship next month, is a derivative of its current product, the Poqet Computer. The Poqetpad is slightly larger — 9.7- by 4½-in. and 1.2-in. thick — but still has only IBM Color Graphics Adapter-compatible graphics.

It runs Microsoft Corp.'s DOS 3.3, a DOS shell and handwriting-recognition software made by Nestor, Inc. in Providence, R.I. List price is $1,995, which includes Traveling Software, Inc.'s communications utility, Penconnect. Like the extant Poqet, the Poqetpad runs on two AA-size alkaline batteries and promises at least 16 hours of battery life.

Poqet also announced that it was the first company to license Grid's Penright operating environment, available to users for an extra $148.

Sources close to Grid said the company will soon land similar agreements with IBM and NCR and that the company is readying a new pen product line. April will bring a sub-3-pound subnotebook priced below $1,500. Grid refused to comment.

MICHAEL FITZGERALD

Microsoft, Intel set to boost portable power

Microsoft Corp. and Intel Corp. unveiled plans last week to attack portable computing inadequacies by offering an approach designed to extend the battery life of such systems by as much as 25%.

Portables using the technology could be hitting the shelves of retailers as early as this summer, according to Intel. Thirty-one personal computer vendors have said they will support it.

The pair's Portable Computing Initiative is a multipronged design that also covers other issues such as support for flash memory cards and data transfer between portables in the sizzling market for laptop and notebook computers. Dataquest, Inc. said it expects the size of that market to double during the next three years.

At the heart of the plan is the Advanced Power Management (APM) specification, which addresses complaints that the current crop of batteries for portables are barely meeting user needs. APM allows the BIOS and the operating system to share critical on-system use, which they have never been able to do before.

Earlier efforts in power conservation have focused on built-in hardware, with vendors trying to circumvent energy problems by using features such as a disk drive or processor that shut down when the keyboard is not used for roughly five minutes.

The APM specification can be used with any machine running an Intel 8086 chip set or compatible, including wares from companies such as NEC Corp. and Advanced Micro Devices, Inc., according to Brad Chase, Microsoft group product manager.

Several hardware vendors have already begun building the special BIOS needed to take advantage of APM in their machines, said David Ryan, Intel's marketing manager.

Microsoft also shipped the read-only memory (ROM) version of MS-DOS 5.0, which allows the DOS operating system to reside in 64K bytes of ROM, freeing up the system's random-access memory for users' applications and data. That could be good news for emerging technologies such as pen-based computers, which may require ROM-based operating systems.

Microsoft also unveiled Interlink, a data transfer utility available to all licensees of DOS 5.0 that use a client/server architecture to connect portables with one another or desktop PCs.

JAMES DALY

Compaq said to be readying high-end notebooks

Two high-end notebooks — the first products from the new Compaq Computer Corp. — will debut next Monday, according to sources close to the company.

Compaq's LTE Lite notebooks will reportedly be based on Intel Corp.'s 20-MHz and 25-MHz 80386SL power management chips. Each will weigh near six pounds, a new low for Compaq, and sources indicated that pricing will start at $2,899.

The reported pricing seemed to confirm a Compaq spokesman's statement that the firm's next notebook products would show a Compaq dedicated to aggressive pricing on high-performance products. The spokesman refused to comment on the unannounced products other than to say the low-end notebooks Compaq promised last year are still to come.

The new notebooks also indicate that Compaq is in step with competitors relatively early in the SL's life. While numerous vendors have also announced or shipped SL systems, among them Zenith Data Systems, Toshiba America Information Systems, Inc. and Dell Computer Corp., analysts said Compaq had not missed the SL market.

"They're not first, but they're not late," said George A. Thompson, an analyst at Datapro Information Services Group in Delran, N.J.

"There's no question [Compaq] needs those products," said Scott Stein, director of PCs and workstations at Technology Investment Strategies Corp. in Framingham, Mass. He said the SL was a hot processor and that the announcement would help Compaq reverse a trend of being behind its competition.

According to sources, the 20-MHz version will initially have a 40M-byte hard drive and come standard with 4M bytes of random-access memory, while the base model 25-MHz version comes with a 60M-byte hard drive and 4M bytes of RAM. Both machines are also expected to have a monochrome IBM Video Graphics Array-compatible display and 3½-in. floppy drives. The hard drives will be upgradable.

MICHAEL FITZGERALD

CORRECTIONS

The Jan. 6 Technology Analysis repeated an error that appeared in *Infoworld*'s Aug. 19, 1991, review of Microsoft Corp.'s Visual Basic. The correct *Infoworld* score for ease of use was excellent, and the overall score was 9.0.

....

Due to a reporting error, an article in the Dec. 23, 1991/Jan. 2, 1992 issue, "Court cases that will change your job," incorrectly described the IBM/Comdisco, Inc. lawsuit. The story should have referenced a January 1991 suit whereby IBM alleged that Comdisco illegally stripped and resold parts from IBM mainframes.

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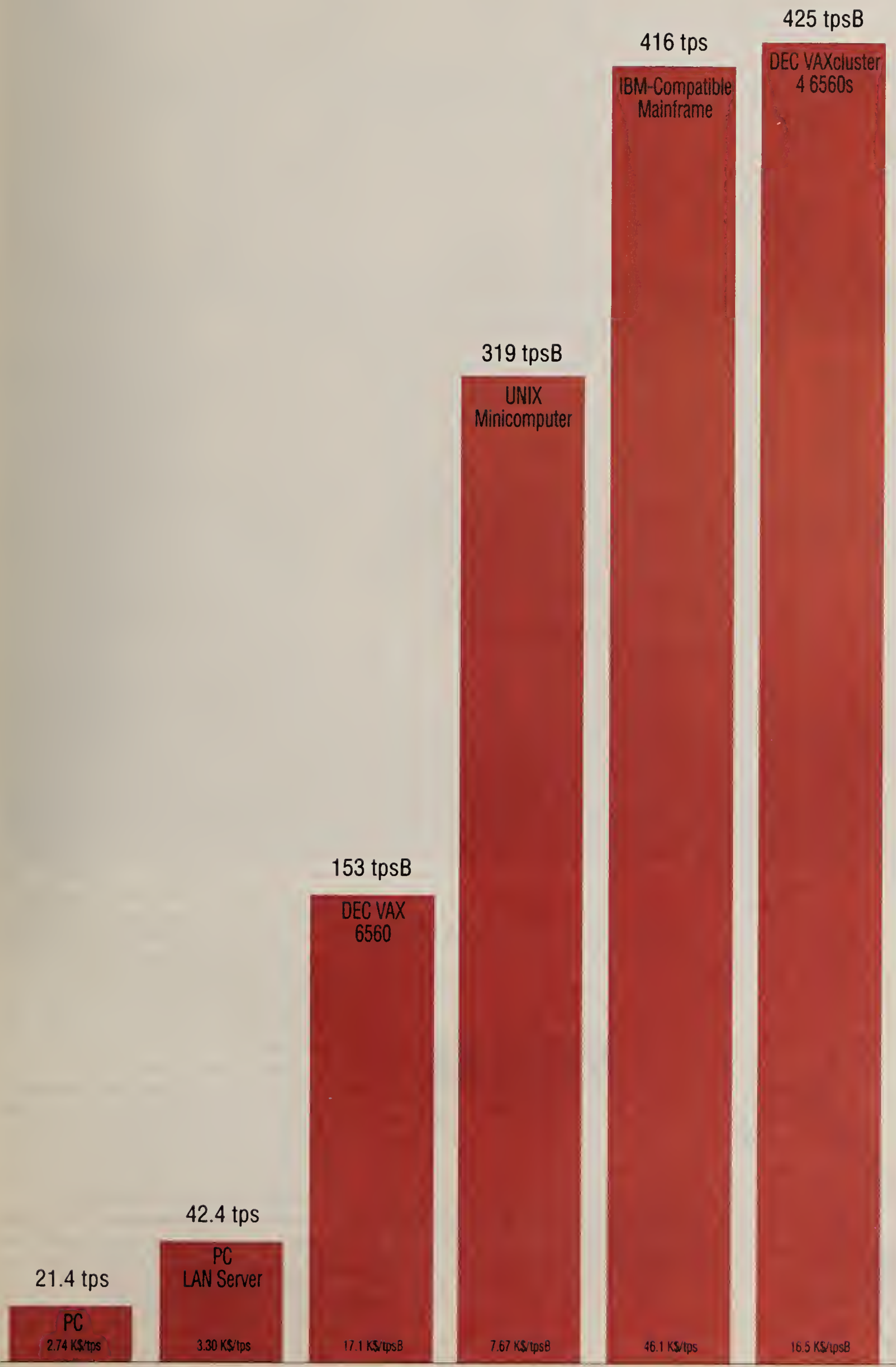

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Microsoft puts toe in groupware waters

BY ROSEMARY HAMILTON
CW STAFF

Microsoft Corp. is gearing up to take on rival Lotus Development Corp. in the emerging groupware market.

Last week, a company official promoting Microsoft's groupware strategy to East Coast industry analysts said the company has no intention of releasing a Lotus Notes-like product. Instead, it plans to provide a more open messaging environment as well as groupware application components, said Laura Jennings, group product manager for work-group applications. Some initial products will be introduced this year, she added.

Notes is Lotus' key groupware offering and is considered the leader in this emerging market. It offers a number of work-group functions such as electronic mail, database-like features, bulletin boards and development tools. Lotus claims to have sold more than 90,000 Notes licenses since the product's 1989 introduction.

"We won't be delivering what we call a proprietary shell or monolithic application," Jennings said, referring to Notes. Groupware "is not a revolution where people want to start over."

Jennings said Microsoft will deliver two unspecified work-group application components later this year, with at least one announcement planned for the first half of 1992. She said Microsoft has plans to deliver bulletin boards, calendaring and conferencing functions.

These components are actually the second phase in a three-step strategy Jennings detailed last week.

First, the goal is to establish what Microsoft calls a messaging infrastructure, which will be based on the company's Mail package. Mail is derived from Consumer Software's Network Courier, which Microsoft acquired last year. This so-called infrastructure will offer the necessary messaging management functions, from the transport specifications and directory services to the gateway architecture and administration tools.

The next step is to roll out the work-group components that will be integrated into Mail. At the same time, Microsoft will promote its Messaging Application Programming Interface so other developers can tailor work-group functions to the Microsoft infrastructure.

The strategy's third phase had the fewest details. Essentially, Microsoft plans to provide capabilities to tailor and customize an individual's groupware environment.

NT developers gain early input

BY JAMES DALY
CW STAFF

REDMOND, Wash. — Microsoft Corp. has brought dozens of software developers into the early design process of its upcoming Windows New Technology (NT) operating system, hoping the added input will result in more tightly integrated applications and avert the persistent crashes that bedeviled early users of Windows 3.0.

Under what is being called Open Process, Microsoft technical personnel will present preliminary specifications of various aspects of Windows NT to independent hardware and software vendors up to 18 months earlier than in previous operating system development cycles. The third-party vendors may in turn present alternative approaches to the updated operating system, which is expected to ship in the second half of this year.

"The typical development process involved third-party developers at a point where there was little opportunity for them to make significant changes," said Cameron Myhrvold, director of developer relations at Microsoft. He added that the entire developer community will still be given a crack at new technical specifications at regularly scheduled conferences.

Not a payback

Myhrvold said the creation of the Open Process forums "was not an attempt to backfill past problems." Microsoft was forced to offer a maintenance upgrade to Windows 3.0 only six months after its release when a large number of programs crashed soon after flashing "Unrecoverable Application Error" on-screen.

Developers said they are highly enthused about their newfound ability for early input.

"I think we all recognize that we can get much further faster if we share important ideas and work the glitches out of the standards before they become problems for users," said Userland Software, Inc. President Dave Winer, who has participated in the Open Process meetings.

So far, changes based on independent software vendors' input have ranged from the minor tweaking of a messaging application programming interface to the extensive readjustment of the command architecture of the Object Linking and Embedding 2.0 structure, Myhrvold said.

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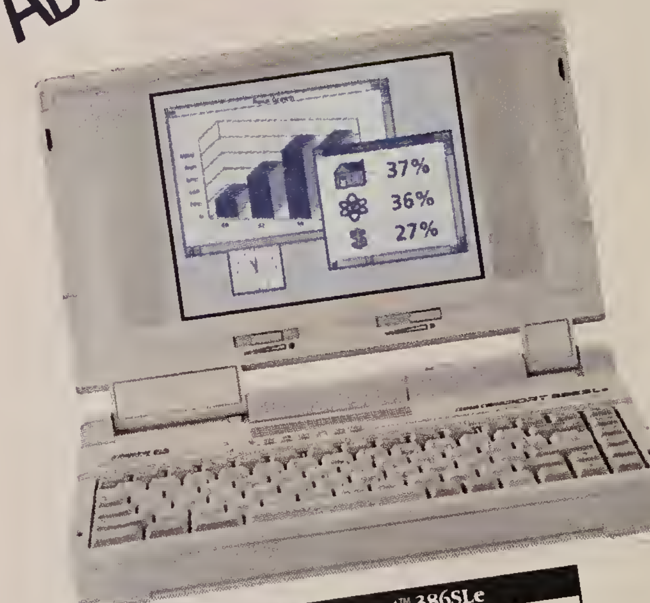

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Timeplex looks ahead with broadband switch

BY JOANIE M. WEXLER
CW STAFF

WOODCLIFF LAKE, N.J. — Timeplex, Inc. said last week that it will join the ranks of early broadband switch makers lining up to accommodate the handful of users eyeing high-speed backbone technologies.

The announcement came during the first joint conference held by executives from Timeplex and its new owner, Ascom Group, since the Swiss firm acquired Timeplex from Unisys Corp. this past September.

Timeplex's $100,000 to $300,000 Synchrony broadband switch, due out in mid-1993, is based on a Synchronous Optical Network architecture, an emerging fiber-based technology supporting speeds of 150M to 2.4G bit/sec. The backplane is slated to accommodate emerging frame relay, cell relay, Switched Multimegabit Data Service and Integrated Services Digital Network technologies alongside traditional circuit-switched traffic.

Reportedly compatible with Timeplex's Link/2 multiplexers, Synchrony does not build on the firm's TX3/Superhub architecture, as was originally planned. Users and analysts said this could create confusion as to whether markets will persevere for both high-capacity switches.

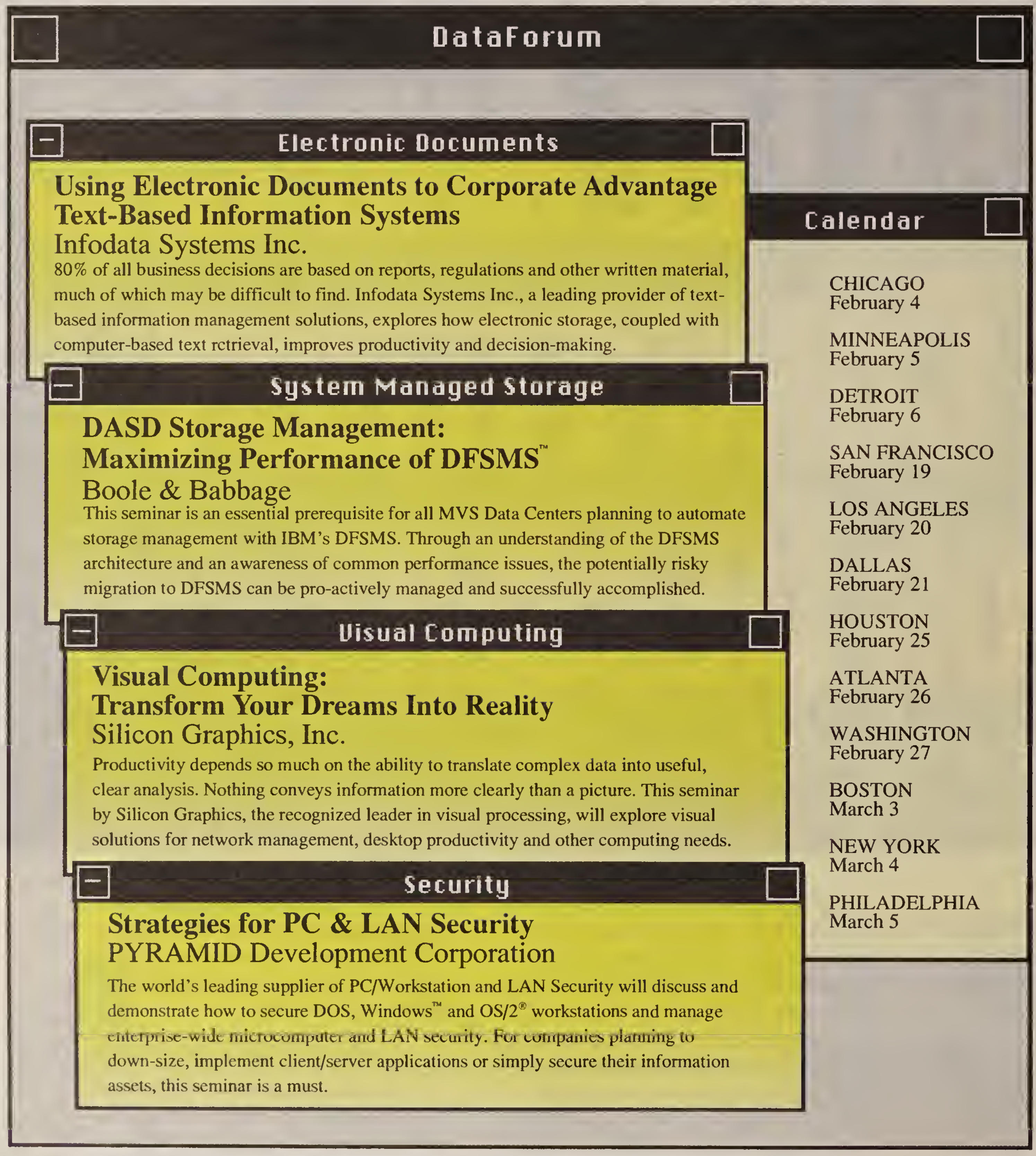
Instead, Synchrony will challenge switches from the likes of Adaptive Corp. and T3plus Networking, Inc. — vendors already facing slim customer pickings in the neophyte broadband market. A similar switch, dubbed "Paris," is under construction at IBM.

Users and analysts questioned the timing of broadband public service availability and the arrival of applications to merit such industrial-strength products in the near term.

"Broadband is definitely down the road, but whether the carriers will have broadband services available when the equipment ships is a question," observed Christopher Durney, communications consultant at Liberty Mutual Insurance Co. in Portsmouth, N.H.

Durney is a user of Timeplex's Link/2 multiplexers and TX3/Superhub, which concentrate multiple T1 lines over a T3 (45M bit/sec.) circuit. The high-speed applications currently justifying the TX3 switch include consolidating T1s to support local-area network interconnect traffic and tape archiving, Durney said. He said he is also exploring image and client/server applications "that might require that amount of bandwidth."

"The public services Timeplex is hoping to capitalize on won't be available for another 18 months," said Doug Gold, an analyst at International Data Corp. "However, it is key that they have a product that interfaces with carrier services so the carriers will partner with them to sell the switches to end-user sites."



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CDC to resell NEC systems

BY ELLIS BOOKER
CW STAFF

MINNEAPOLIS — Control Data Corp. (CDC) reached an agreement last week to resell NEC Corp.'s SX-3 supercomputer in North America and Europe.

NEC has managed to sell just one supercomputer in the U.S. to date, and in a statement, the company said it saw the need to expand its distribution channels. CDC, in turn, said it would focus on its customer base, primarily in the automotive and aerospace industries.

However, CDC may prove to be an important vehicle for placing NEC machines in government accounts, where domestic supercomputer suppliers have traditionally had a lock.

"It would be exceptionally difficult for NEC to bid its products in sensitive government contracts," said Jeff Canin, an analyst at Montgomery Securities in San Francisco.

Third time's a charm

The NEC deal is CDC's third supercomputer marketing agreement since the company abruptly closed its own supercomputer unit, ETA Systems, Inc., in April 1989 as the major part of a $490 million restructuring. CDC also remarkets systems from Cray Research, Inc. in Eagan, Minn., and Convex Computer Corp. in Richardson, Texas.

"Actually, both [the Cray and Convex pacts] have slowed down over the past year," said CDC's Computer Products Group President James E. Ousley, who noted that Cray and Convex, unlike NEC, have marketing organizations in the U.S. and so compete with CDC for sales.

NEC does in fact have a marketing beachhead in the U.S. in the form of its wholly owned subsidiary, HNSX Supercomputers, Inc. in Burlington, Mass. Ousley said HNSX will evolve over time into the technical support arm for CDC's sales of SX-3 systems, which typically cost $15 million to $25 million.

A final benefit of the NEC pact, Ousley said, is the possibility that NEC will act as a reseller of CDC equipment in Japan.

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Network limits dampen Apple multimedia hopes

BY JAMES DALY
CW STAFF

SAN FRANCISCO — While Apple Computer, Inc. noisily celebrated the coming out of its Quicktime multimedia extension at last week's Macworld Exposition, a lack of networking technologies able to handle beefy multimedia applications dampened the festivities.

"Networking is what's really going to make multimedia take off, and right now, you just don't see those necessary standards and products falling into place," said Nick Arnett, president of Multimedia Computing Corp. in Santa Clara, Calif.

Like Microsoft Corp.'s Windows with Multimedia Extensions or IBM's multimedia extensions to OS/2, Quicktime focuses on managing data flow at the client but offers few solutions for optimal network performance.

Although it is capable of sending multimedia presentations — including live video — over a local-area network, users may discover that the network bandwidth requirements for such a setup may be too large, too costly or simply unavailable.

Apple Chief Executive Officer John Sculley noted that Kaleida, Apple's joint venture with IBM to create multimedia standards, will be working on connectivity issues, but he said existing technologies "are still going to predominate for a while."

Today, networked multimedia poses sticky technical problems. The highest hurdle is that real-time transmission of audiovisual data cannot be delayed. Unlike telephones, networks never give a busy signal; they just slow down. Yet many networks use contention schemes that result in varying throughput.

"Obviously, this is unacceptable for audio, video animation and other time-based events," Arnett said.

One solution is the neophyte FDDI-2 LAN, designed specifically with the real-time clock synchronization needed to integrate voice, video and data. Chip standards are nearly complete, though Apple recently scaled back its support of the standard [CW, Dec. 9, 1991].

A lot to handle

Another big transmission problem is the size of the multimedia data. Remarkable video compression rates have been achieved, but even when this data is crammed down to compact disc/read-only memory speeds of 1.5M bit/sec., that is a lot for a typical LAN to handle.

Those transmission rates are also impractical for slow networks such as Apple's Localtalk, Arnett said, and are barely tenable for a 10M bit/sec. Ethernet setup.

Hybrid systems that carry video information over an analog broadband network, like the kind used in cable television, are one solution.

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DEC shows way to videoconference

BY MICHAEL ALEXANDER
CW STAFF

MAYNARD, Mass. — Digital Equipment Corp. last week disclosed plans to market a multimedia application that enables two to six users to participate in videoconferences on DEC's reduced instruction set computing (RISC) workstations.

Decspin, or DEC sound picture information network, transmits live or stored audio and video images using standard protocols over Fiber Distributed Data Interface, Ethernet and leased lines. A single-user Decspin license is $2,995.

The multimedia application is an efficient way to hold business meetings without the bother or lost time associated with traveling, said Jack Toto, multimedia marketing manager for Unix-based software and systems at DEC.

Two DEC software engineers originally developed Decspin for use inside the company. Early adopters of the technology are likely to be the military, Wall Street traders and school systems, Toto predicted.

The minimum hardware required includes a Decstation 5000 Turbochannel-based workstation, 24M bytes of memory, 500M bytes of disk storage, an audio and video board, a frame buffer, a video camera, a microphone and a network connection. An entry-level DEC RISC-based workstation with the minimum hardware and a single-user Decspin license costs between $14,000 and $22,000.

"This is probably one of the most economical ways to do videoconferencing," said Barbara Ells, who follows multimedia at MWA Consulting, Inc. in Palo Alto, Calif. "It's about one-tenth the price of standard videoteleconferencing systems. Not everyone will have it on their desktop — it will be used in a videoconferencing room. In certain environments where there are development projects split among locations and a higher number of workstations, already you may see this particular tool in greater numbers."

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TECH TALK

Exploring CD-ROM

■ The National Geographic Society is the newest member of the Multimedia Publishers Group, a trade association formed to promote sales of compact disc/read-only memory (CD-ROM). National Geographic's first titles are "Mammals," a CD-ROM with motion-film footage; and "Presidents," an interactive encyclopedia of the personal and political lives of the country's leaders. Both discs have suggested retail prices of $149.95.

Super things to come

■ The Central Weather Bureau of the Republic of China (Taiwan) has ordered two Cray Research, Inc. supercomputers, according to the company. The Y-MP8I supercomputer will be used for daily weather forecasting throughout the country, and the Y-MP EL entry-level system will be used as a file server. The Cray Y-MP8I will also run a relational database management system with a unique binary large-object attribute. The attribute is ideally suited for storing data that has no easily defined structure, such as data and images from satellites. Cray said it has received five orders for the Y-MP8I and 40 orders for the Y-MP EL.

High-tech, high-touch

■ Andover Controls Corp. introduced what it claimed is the first graphic-style, touch-screen display for building automation systems. Called the DCX250, the new display enables building operators and occupants to operate systems for lighting, heating, ventilation and other building facilities by touching on-screen icons representing switches, knobs and other controls. Each screen comes equipped with a library of switches, knobs and other graphical controls and can be programmed in Andover Controls Plain English, a programming environment. The screen retails for $1,350.

Computers polish Hubble images

Scientists use supercomputer, statistical inference to correct telescope imaging flaw

BY MICHAEL ALEXANDER
CW STAFF

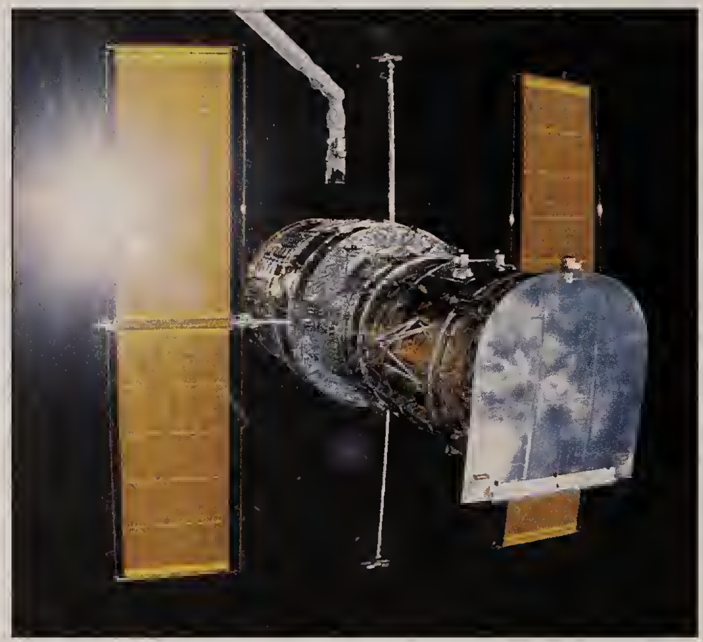
Scientists at NASA's Goddard Space Flight Center in Greenbelt, Md., are using a massively parallel processing supercomputer to restore images captured by the ill-starred Hubble Space Telescope (HST). The enhanced images are as good as the ones the HST would be capable of transmitting without the flaw that now causes the telescope to send back blurry images, the scientists said.

"I believe that there's nothing better than taking a picture correctly the first time, but we are able to get resolution that is at least as good as the space telescope was intended to do," said John Dorband, a computer scientist and deputy project manager for systems software research at the center's Space Data Computing Division.

Using a formula for statistical inference called the "maximum entropy method" and a massively parallel processing supercomputer, the scientists were able to use available data to restore the missing data, Dorband said.

The image restorations are computed on a Maspar Computer Corp. MP-1 massively parallel processing computer with 8,192 processors.

Scientists and others have been using computers to "deblur" images for at least 20 years, said Jan M. Hollis, an astronomer and assistant chief at the Space Data Computing Division. "However, in the past, people have used scalar machines, and they have had to wait hours or even days to get these kinds of results. We can do this within minutes in certain cases and within a maximum of a few hours," he said.


NASA

NASA scientists salvaged *blurred images from the Hubble Space Telescope with a Maspar supercomputer*

Soon after the HST was put into orbit in April 1990, scientists discovered that the images captured by the telescope's "faint object camera" were blurry because of a spherical aberration caused by a mirror ground to the wrong specifications. Also, the $1.5 billion telescope was found to be unable to distinguish very faint objects.

Now, NASA's scientists say this technical gaffe and the computer program they developed to compensate for it may actually allow them to generate better images than might have been possible with the HST alone.

One of the first stellar objects the HST was trained on was the R Aquarii binary star system, which is considered a sort of Rosetta stone for many astrophysical processes.

The problem of the blurred images was compounded by the inability of the faint object camera to accommodate the unexpectedly intense light emanating from R Aquarii, which in turn produced saturated, unreadable data, Hollis explained.

"We played around with the images for a few months before we realized that the actual flaw in the Hubble Space Telescope helped us," Hollis said. "The point spread function of the telescope — how the telescope responds to a point source of light — was spread over many more pixels than the saturated region. We could statistically infer from the data from the area not affected by the saturated region what had actually happened in the saturated region."

The success of the image restoration project will have spin-off benefits in other areas of image processing as well as for parallel processing computers, according to Hollis.

NASA still plans to repair the HST in late 1993 or early 1994. Some advocate fixing the telescope in orbit with an optically correct camera and an optical device that would fix the spherical abberation; others argue for bringing it back to Earth and replacing the mirror.

Intelligent computer may be reality by 2001

BY MICHAEL ALEXANDER
CW STAFF

If enough computer scientists put their minds to it, the first Hal-like computer could be produced by the year 2001. At least that is what Intelligent Computers Systems (ICS) Research Group, Inc., a newly formed, nonprofit corporation based in Rockville, Md., believes.

The company was formed with financial help from an unspecified group of backers to raise money for the research and development of a Learning and Thinking Machine (LTM). The company plans not to build an LTM but to sponsor the efforts of others, said Peter Lockwood, a technical analyst and spokesman at ICS Research.

An LTM would be endowed with many of the same capabilities of Hal, the supercomputer depicted in Arthur Clarke's *2001: A Space Odyssey.*

The computer would be able to suck up information by scanning books, tapping into on-line databases and listening to the spoken words of experts. It would also be able to independently draw conclusions from what it has gleaned as well as learn from experience.

"One way to describe it is as a self-modifying, general-purpose expert system," Lockwood said. Unlike most expert systems that have rules written out explicitly by a knowledge engineer, the programmer instructs the LTM to focus its attention on specific information, and the machine uses whatever facilities are available to it to become an expert in that area. Over time, the LTM learns from its own operation and results, subsequently updating its knowledge base.

"No one is working on this problem, and one of the reasons is that it is generally assumed to be [a] long-term project," Lockwood said. "We feel that there are so many benefits to be gained that someone ought to be working on it directly."

The company was founded by a group of computer professionals who, for reasons that are unclear, wish to remain anonymous. According to Lockwood, the founders believe that promoting research in this area will pay off with a prototype machine within five to eight years. The cost to build an LTM could vary between $5 million and $10 million, he added.

ICS Research is looking for proposals to design an LTM and has already identified Cognitive Modeling Designs in Rockville, Md., as having a promising approach to building an LTM.

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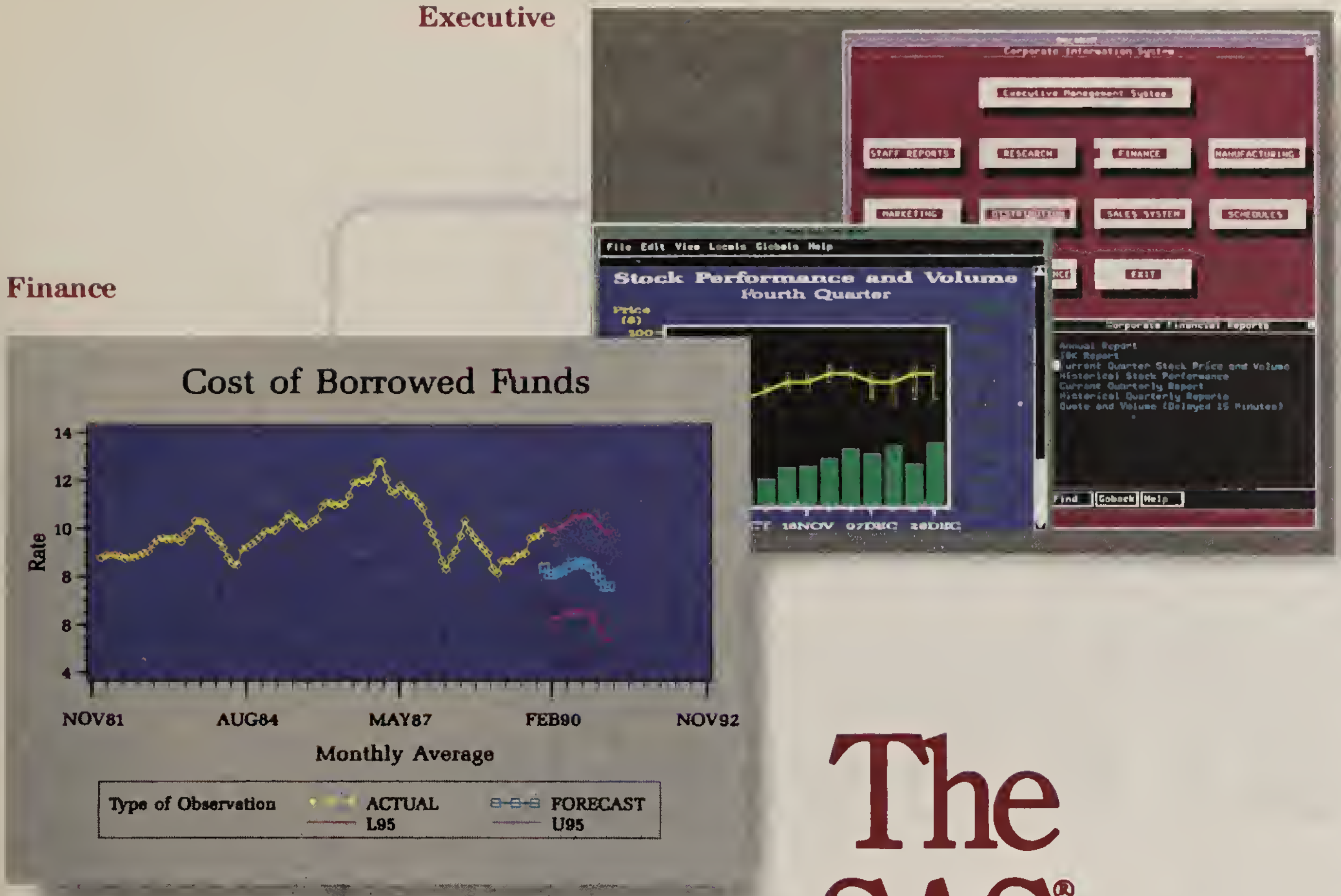

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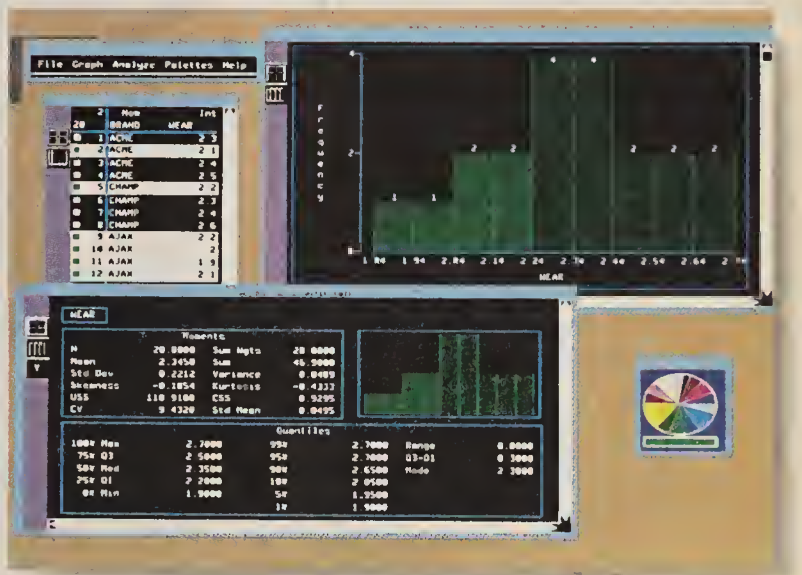

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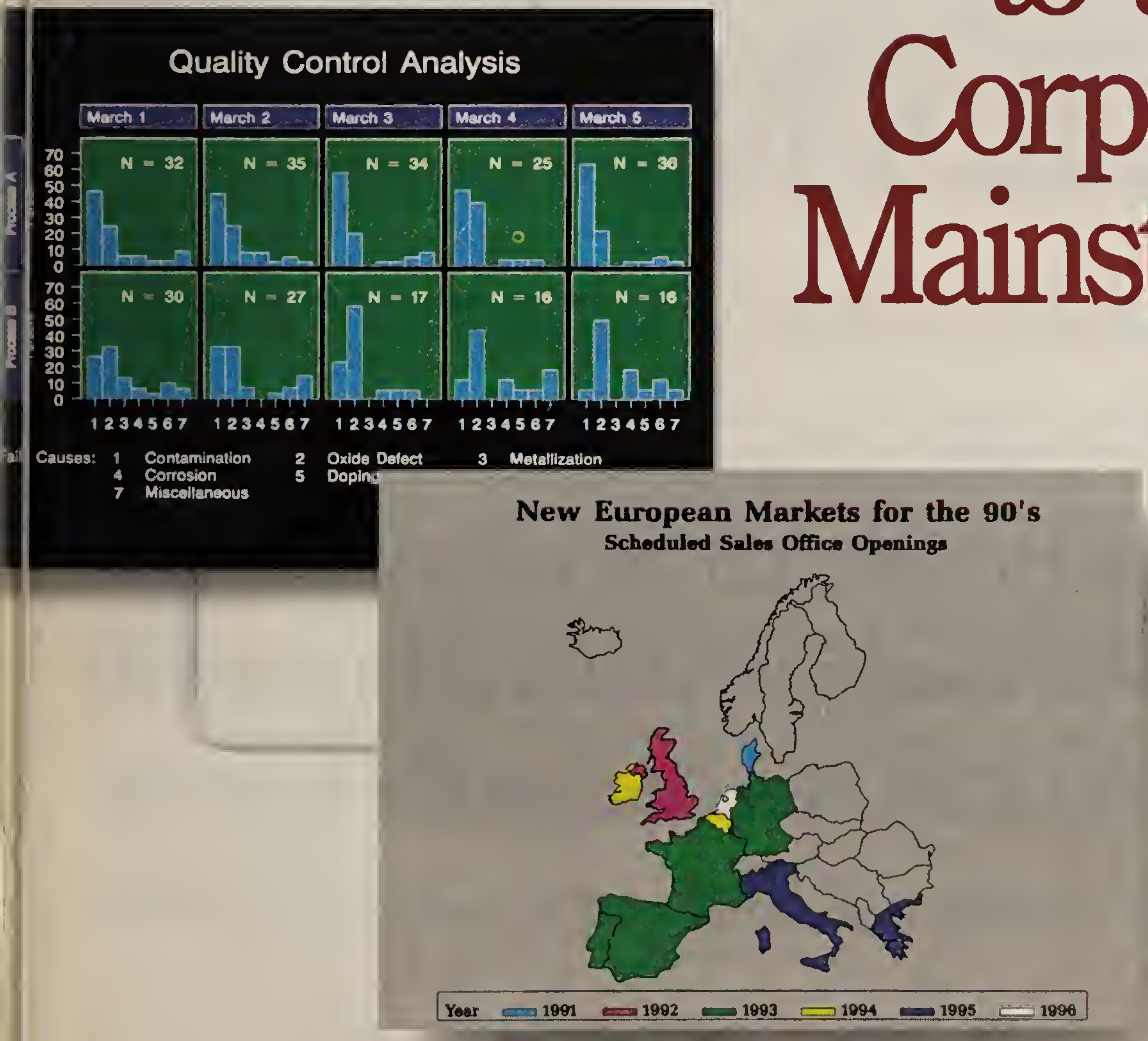

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EDITORIAL

Playing hardball

No one's ever accused Electronic Data Systems of being a wallflower, but its lawsuit earlier this month against Computer Associates was a shocker nonetheless. EDS' filing breaks with the company's normally austere image and makes it clear that it is mad as hell about its charges that CA committed fraud, violated license agreements and meddled with EDS customers.

Equally surprising was CA's "in your face" response. In a defiant reply, the largest mainframe software company dismissed the EDS charges as ridiculous and all but promised a countersuit.

But there is more than a courtroom brawl at stake here. The case, if it ever reaches the courts, promises to be a barn burner, pitting one of the world's largest users against a vendor known to play hardball with its customers.

We won't comment on the merits of the case, but the issues are significant for vendors and users because they involve the basic economics of business consolidation and outsourcing.

At issue is just how much a software company can dictate what its customers do with a software license once they sign a contract. The answer is fundamental to the economics of outsourcing.

Third-party outsourcing contractors can assume dozens, or even hundreds, of software licenses when they take over a data center. As such, they're pros at maximizing economies of scale, and that's one of the appeals of outsourcing in the first place. Why pay license fees on five copies of the same tape librarian when one copy can serve five customers just as well?

That question is what makes outsourcing so bone-chilling for software vendors such as CA, which historically has derived a large part of its revenue from maintenance fees. The anxiety only gets worse when they look at forecasts such as Merrill Lynch's estimate that outsourcing revenue could nearly triple during the next four years.

Expecting outsourcing vendors to maintain or renegotiate every license they acquire is no more realistic than expecting bus companies to reimburse carmakers for every passenger who chooses not to drive. For savvy software developers, this case points up the need for more creative licensing schemes that rely more on how the software is used and less on traditional criteria such as the number of users or the class of machine the software supports. For users, there will be interesting financial consequences. If CA prevails, it will no doubt hike up the cost of outsourcing contracts that involve license transfers. If EDS wins, it should make the economics of scale available through outsourcing even more attractive.

The industry has skirted this issue for a long time, but now some lines must be drawn. With mainframe sales stagnant and interest in outsourcing on the rise, users and vendors will begin to fight over every dollar.

Paul Gillin

Paul Gillin, *Executive Editor*

Methinks the sheriff of Nottingham doth stir the ire of Robin Hood of EDS.
Perhaps this forest is not a safe one for us, sire.
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LETTERS TO THE EDITOR

A good opportunity

I have been reading *Computerworld* since I got into the computer field in 1976. I'd like to point out that there is an opportunity for the computer industry to do a great service for mankind and, in the process, bring profit and glory to itself. The opportunity is in the area of a standardized Systems Application Architecture-like interface to PCs for paraplegics.

Some paraplegics are 100% paralyzed and can move only their eyelids. Because my brother worked as an orderly at the Kestler Institute, a prestigious center that treats the worst cases, I know for a fact that there is no computer hardware or software at all for extreme paraplegics. The way a paraplegic communicates is with flash cards. When the nurse points to a letter the paraplegic wants to use, a blink of the eye is the sign.

If Bill Gates or Philippe Kahn or Steven Jobs, etc., had a relative who was a paraplegic, certainly Windows NT or Borland's IDE or Next would have a paraplegic mode. A lot of paraplegics are veterans who fought in wars to make us free. Isn't their sacrifice worth, say, delaying IBM's OS/2 Release 2.0 an extra quarter, to add an industry standard paraplegic interface?

Robert Glover
Dreyfus Service Corp.
Jersey City, N.J.

Arrows on target

It was with great amusement and, I admit, some concern, that I read your editorial cartoon in the Dec. 16 issue. The idea that business is somehow stuck shooting more and more information technology arrows (read: dollars) in an effort to build new systems or tools to improve productivity may seem funny to some, but unfortunately, it has never been more true.

The cartoon is right on target (pardon the pun). Companies keep missing the mark in their application of technology to improve productivity. The biggest misconception about end-user productivity improvement products is that organizations must build new information technology systems in order to gain this benefit. The "untold story" is that the investment should be made to teach people how to use the existing technology.

Businesses do not want or need "Star Wars" types of technology to improve productivity. Organizations that sucessfully use information technology to improve productivity aren't necessarily "cutting edge" or "progressive." They're just smart.

George Langan
Goal Systems
International, Inc.
Columbus, Ohio

Overlooked Amiga

In "Apple stocking antipiracy ammunition" [CW, Dec. 16], I was made aware of a new PC in Commodore Business Machines, Inc.'s line of products: the Atari ST. This particular mistake points out a bias in mainstream computer journals that does us all a disservice.

The PC market is clearly dominated by IBM and the clones, with a first-order perturbation dominated by Apple Computer, Inc. Clearly, the reporting in a journal that covers PCs (even from an IS perspective) will reflect this. But there are vertical markets where other machines are significant players. I am thinking, in particular, of desktop video or, in a broader sense, multimedia. Here the market has been dominated by another product in the Commodore line of PCs: the Amiga.

When you consider products that are actually on the market, I would argue that Commodore is still a leader in multimedia — there is no arguing its lead in desktop video. In your coverage of multimedia, you have, at best, mentioned the Amiga as "another" competitor in addition to the clone and Macintosh markets, but usually it is not mentioned at all. Whatever the source, this bias limits the information available to your readers and thus their ability to make an intelligent choice in that market.

I bought an Amiga in 1986 because it was a superior computer to the IBM PC and the Macintosh. It still is. That is why Commodore has sold 3 million units despite its incompetence in marketing. If accurate and complete reporting helps bring a broader range of quality third-party software developers to the Amiga platform, the market will be richer for all of us. Keep this in mind when you report on vertical markets. And try to keep your facts straight.

Bradley W. Hulyk
Katy, Texas

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Policy and free-market status

GARY H. ANTHES

Many things once held dear by millions of people — such as communism and drive-in movies — have been either discredited or simply overtaken by events. May I suggest we add laissez-faire capitalism, as interpreted by the Bush administration, to the long list of ideas whose time has passed?

According to the current administration, anything that smacks of "industrial policy" amounts to unwise interference with free-market forces. Industrial policy is generally derided as "picking winners and losers," a phrase that carries with it an implied sneer, daring anyone to suggest the government actually might want to do such a thing.

But that's ludicrous because the government picks winners and losers hundreds of times a day: every time it awards a competitive contract, passes a law or makes a judicial decision.

Notable exceptions

The U.S. Department of Defense has spawned fundamental new technologies. The U.S. Department of Justice and the courts have engendered a vibrant telecommunications industry. And, the government built the aviation industry, the federal highway system and a host of supporting industries.

To be fair, not all of these things are of the sort opposed by the George Bushes and Ronald Reagans of the world. And one could easily put together a list of federal fiascoes that resulted from attempts to jump-start new commercial enterprises. Nevertheless, the point that often gets overlooked is that the government has scored some spectacular successes in intervening in the marketplace.

Furthermore, several trends have worked to take much of the persuasiveness out of the textbook case for free markets.

First, the markets in a number of countries with which we compete are anything but free, manipulated for domestic advantage by government policies and industry alliances.

Second, with the end of the Soviet threat, the flood of commercial technology that once spun off from military research and development will dwindle. Third, the near-demise of private venture capital for high-technology start-ups leaves entrepreneurs in ever more difficult straits.

The administration should come clean and admit that the government routinely takes actions that strengthen beneficial market forces. That bit of candor would then set the stage for the government to do more to stimulate new markets and technologies.

Niculae Asciu

The Defense Advanced Research Projects Agency (DARPA) offers some clues about how the government can help. The relatively obscure agency deserves much of the credit for sponsoring development of a stunning array of important technologies, including interactive computer graphics and lasers.

DARPA has several characteristics worth emulating. It is almost unbelievably lean and mean by government standards, with about as much bureaucracy as you'll find in a Silicon Valley start-up on a Friday afternoon.

Understanding progress

But DARPA is at a crossroads; free-market thinkers in the White House ousted DARPA's brilliant but outspoken director, Craig Fields, causing the agency to curtail some of its more innovative but controversial projects.

A further reining in of the agency would be a big mistake. DARPA's budget and mission should be expanded, especially toward developing generic technologies that have commercial as well as military applications.

We don't need any more studies of which technologies are critical and which are being lost to the Japanese or of what ails U.S. industry.

We need a little less ideology and a little more honesty about what works and what doesn't. And we need to get out there and pick some more winners.

Anthes is *Computerworld's* Washington, D.C., correspondent.

Stop the technology train from derailing your company

BOB GILBERT

Ever wonder where we would be in the year 2000 if we were to stop installing new technology for two years? An insane proposition? Maybe not.

Most of us have recently made significant investments in new technologies but have obtained only partial deployment. Our investments have typically included mainframe and network-based relational database software, one or more LAN manager products, CASE tools, some expert systems utilities and two or three object-oriented development tools.

We are just beginning to understand and use the capabilities of some of these products, including capabilities that support fundamental shifts in our approach to designing and supporting computer applications.

However, the support infrastructure may not be fully implemented. Many in IS are still working with the old technology.

Are we moving to improve this situation? No. We are adding confusion by continuing to study and request installation of more and more technology. Look around. We all have some level of uncoordinated technology evaluation in process.

Do you see any prototypes or pilots involving new products? Sure you do. Some are formal, backed up with an approved project proposal; most are informal, with objectives loosely defined. Some are new technology; most are just another form of technology we already support.

These prototypes and pilots often do not examine interfacing with the existing environment. Criteria for measuring success of new product testing usually do not exist, particularly in the informal studies. And it should not surprise us to find duplicate product evaluations resulting in inconsistent conclusions.

Continuous uncoordinated assessment and introduction of new technology is adding complexity to an environment that is already too complex. Most of us need to stop this train, understand real technology priorities, establish some rules (principles) for technology management and get back on the right track.

There are a number of ways we can usefully apply our energy during the pause:

- Get our IS teams tuned to the business "drivers" that define technology opportunities. This is the key to establishing priorities for applying existing technologies and introducing new ones. A thorough analysis will result in a very short list of required new technologies.
- Put some technology stakes in the ground with solid products and suppliers that will be in the winner's circle down the road. To some this means putting a standards process in place, but it also means ensuring that there is a necessary training and support infrastructure.

One way to do that is to discourage proposed evaluations directed at different flavors of technologies we already support, particularly products we know continuously "leapfrog" each other.

- Examine and refine the basic project management processes and organizational responsibilities such as who reviews and approves new technology assessment projects, the expected content of the project proposals and how and when progress is to be reported.

Establishing principles and procedures addressing these issues will help our friends in the workplace who fall in and out of love with new products several times a year.

- Finally, we can learn to manage the expectations of our customers, who also see the vendor announcements that make it all sound easy but fail to mention additional costs or complexities associated with start-up, interfacing, training, data conversion and continuous behind-the-scenes support.

Ever wonder where we would be in the year 2000 if we stopped installing new technology until we developed and implemented these basic technology management processes? Think we could do it in less than two years?

Gilbert retired at the end of the year from Eastman Kodak Co. He is now an independent consultant in Rochester, N.Y.

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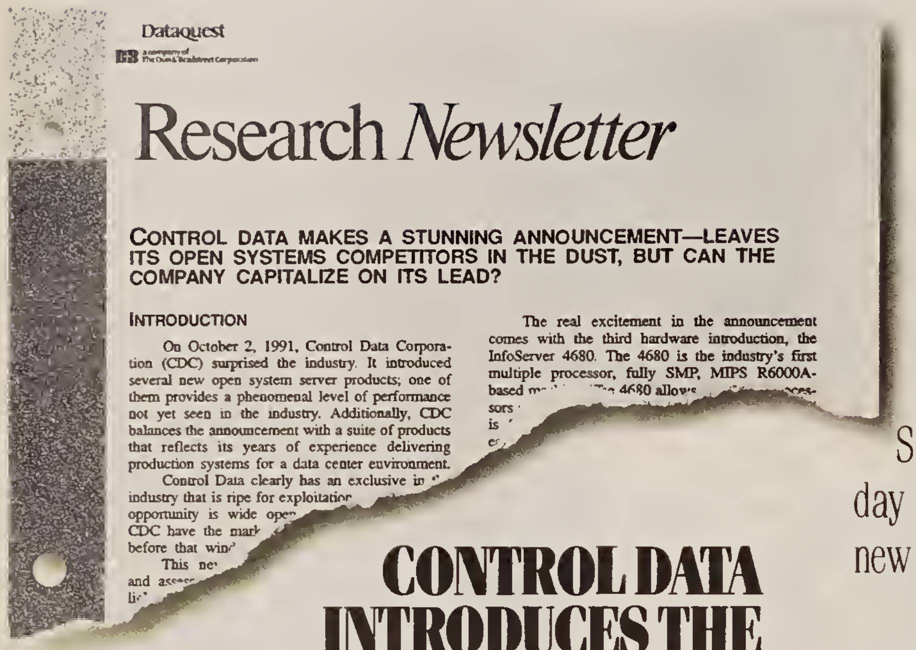

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Research *Newsletter*

CONTROL DATA MAKES A STUNNING ANNOUNCEMENT—LEAVES ITS OPEN SYSTEMS COMPETITORS IN THE DUST, BUT CAN THE COMPANY CAPITALIZE ON ITS LEAD?

INTRODUCTION

On October 2, 1991, Control Data Corporation (CDC) surprised the industry. It introduced several new open system server products; one of them provides a phenomenal level of performance not yet seen in the industry. Additionally, CDC balances the announcement with a suite of products that reflects its years of experience delivering production systems for a data center environment.

Control Data clearly has an exclusive in [illegible] industry that is ripe for exploitation [illegible] opportunity is wide ope[illegible] CDC have the mar[illegible] before that win[illegible]

This ne[illegible] and ass[illegible]

The real excitement in the announcement comes with the third hardware introduction, the InfoServer 4680. The 4680 is the industry's first multiple processor, fully SMP, MIPS R6000A-based [illegible] The 4680 allows [illegible] sors [illegible]

We've got the best open systems superservers. But don't just take our word for it. Take Dataquest's.

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Excuse us, but we at Control Data really do have the biggest innovation in open systems computing. Not Sun Microsystems. Not Digital. Not any of our competition.

It's called the 4680 InfoServer,™ and it's the industry's first mainframe-class UNIX server. But more importantly, it's *the* fastest, *the* most expandable multiprocessor on the market today. In fact, as industry analysts at Dataquest® report, it delivers "a phenomenal level of performance yet unseen in the industry."

It is, to continue in their words, "a stunning announcement" that "leaves its open systems competitors in the dust."

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In plain English, as Dataquest writes, it "delivers all the requisite attributes that both leaders and niche players in the open systems market boast about."

Comparison of UNIX-Based RISC Servers

Performance	**CDC 4680**	**DEC 5800**	**HP 750**	**IBM 950**	**SUN 690 MP**
Maximum No. of CPUs	4	4	1	1	4
SPECmark/SPECthruput (Max)	205	39	78	72	91
AIM User Loads	1381[a]	65[b]	*NP*	310	*NP*
TPC-B (Oracle)	112[c]	*NP*	*NP*	*NP*	*NP*
Max. Disk Capacity (GB)	179	58	40	22	52
Standards Compliance					
POSIX Certified UNIX	YES	YES	NO	YES	NO
OSInet Interop. Registration	YES	*NP*	YES	YES	*NP*

[a] With four processors; certified and tested by AIM. [b] With one processor; multiprocessor data not available.
[c] With two processors at a price of $6.3K/tps. NP = Not Published

BUT CONTROL DATA DOESN'T MERELY PROVIDE GREAT HARDWARE.

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SYSTEMS WHEN EVERYONE ELSE IS MAKING THE SAME CLAIM?

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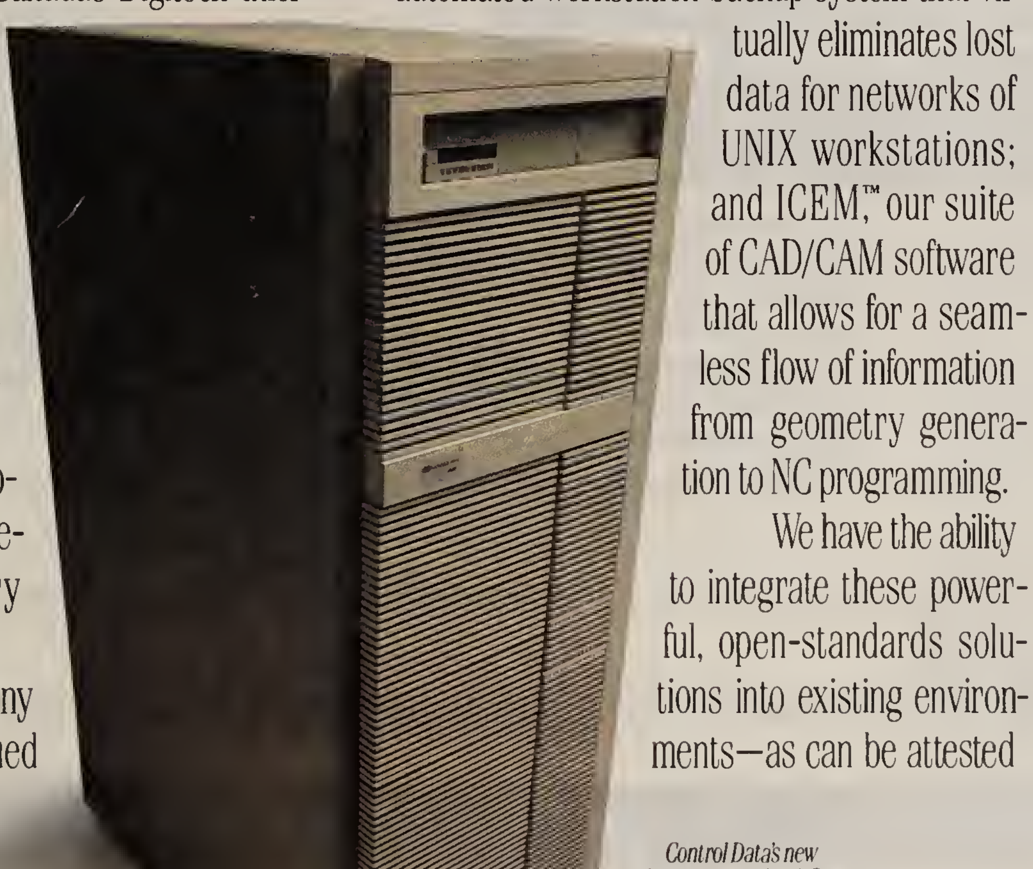
system that allowed for only fragmented communications, to a single highly integrated system that is literally transforming the way they do business.

And, to modernize key aspects of the space shuttle program, we integrated a large number of open systems products for the Flight Analysis and Design System (FADS) program.

In Denmark, FIH (Finance for Danish Industry), highly regarded throughout the financial community for the innovative ways it combines information technology with marketing, chose the InfoServers for an ORACLE client/server environment that integrates open systems technology with over 100 PCs.

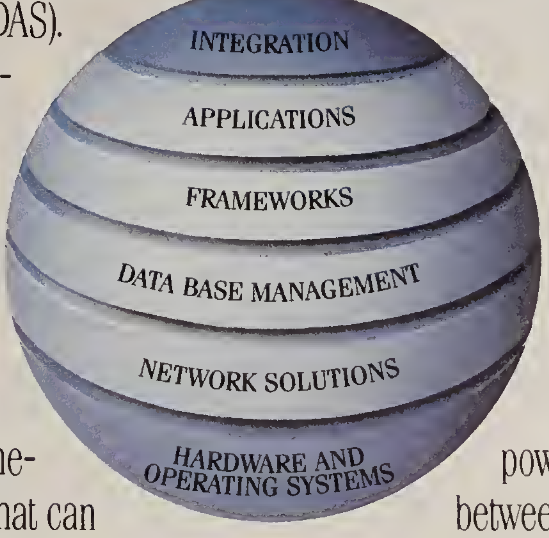
Similarly, when Canada's Digitech Information Services, Ltd. needed to migrate its petroleum information database from an antiquated mainframe environment to an open systems alternative, they chose us because we were the only supplier who had implemented the necessary enhancements.

In fact, no company is more uniquely qualified to provide open systems solutions than we are.



Control Data's new RISC-based 4680 InfoServer, the industry's first mainframe-class UNIX server, delivers a "phenomenal level of performance."

We have the hardware—including our 4000 InfoServers and our high performance disk array subsystem (DAS).



We have the operating software and sophisticated networking capabilities. Including FDDI, DECnet, and SNA connectivity, and a complete set of OSI networking capabilities; EDL™, a powerful framework and networking tool that can get an organization working together like it's never worked together before; AWBUS,™ our automated workstation backup system that virtually eliminates lost data for networks of UNIX workstations; and ICEM,™ our suite of CAD/CAM software that allows for a seamless flow of information from geometry generation to NC programming.

We have the ability to integrate these powerful, open-standards solutions into existing environments—as can be attested by our 35 years of experience.

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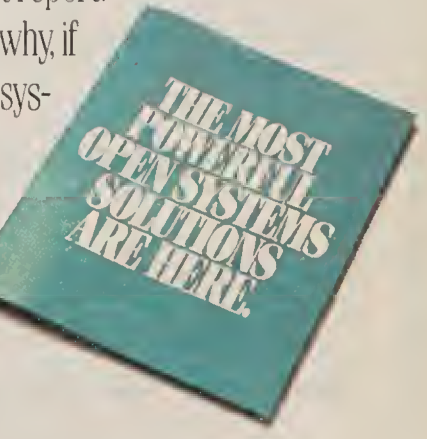

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COMMENTARY

Sam Albert

SAA poised as survivor

You can get a heated debate going about the pros and cons of IBM's latest reorganization, but one consensus seems to have emerged already: It spells trouble for IBM's SAA.

Fortunately, that consensus is dead wrong. But there's a good explanation why so many people have jumped to a mistaken conclusion: Their idea of SAA hasn't kept up with reality.

The original SAA, the one IBM announced back in 1987, was designed to provide consistency across IBM's major operating systems. You might say it was IBM's plan for "internal openness."

But as customers demanded a less proprietary view of computing, IBM built more and more external openness into SAA, including an ever-widening array of international and de facto standards.

In 1989, IBM granted formal diplomatic recognition to the land of Unix and started working to create interoperability between SAA and AIX, its in-house Unix.

By the time IBM made its big Deja Blue announcement last September, SAA had gone beyond mere interoperability to full partnership with AIX as coequal platforms under the "open systems" banner. In fact, IBM devoted a whole press release in that announcement to its "open systems" elements. Yet under the hood, SAA remains the guts of IBM's openness efforts for the

Continued on page 36

No stampede to IBM's Escon

Users get fiber-optic option, although many will wait to use it

ANALYSIS

BY JOHANNA AMBROSIO
CW STAFF

The number of users adopting IBM's Escon architecture will grow rapidly this year because of several factors, perhaps most of all because of an inability to avoid it, analysts said. Virtually everything IBM ships for the high end is or will be Escon-based, they said.

"It's a forced migration," said Robert Callery, senior analyst at Technology Investment Strategies Corp. (TISC). "All the new processors are Escon-only; it will force customers' hands."

Still, most observers said they do not foresee Escon becoming an overnight sensation. It will take several years for the majority of the IBM mainframe installed base to actually use Escon — as opposed to merely having the Escon-capable channels that come standard with Enterprise System/9000 processors.

IBM's Escon architecture, introduced in September 1990, is a fiber-optic-based method of connecting processors, storage devices and other peripherals. Although one critical piece of the puzzle — the adapter that connects 3990 disk drives to Escon — started shipping in September, the internal speed of the direct-access storage device (DASD) and tape control units remains at pre-Escon speeds.

Until IBM enhances the control devices to take advantage of the improved bandwidth of the fiber cable, observers said, many customers will not have a significant enough economic justification for Escon.

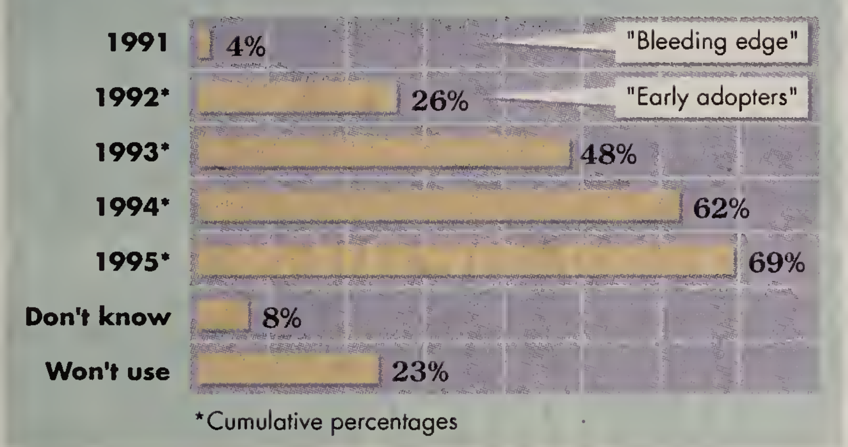
"We certainly will be heading in that direction, but we have no specific immediate plans to go to Escon channels," said Ed Kissinger, director of data processing at American Family Mutual Insurance Co. in Madison, Wis. "There's no real performance benefit in the peripherals, but there will be over the next few years," he said.

Doug Underhill, assistant vice president at CSX Technology, Inc. in Jacksonville, Fla., echoed that sentiment. "We have three ES/9000s with Escon channels on them, but we have no plans to attach anything to them during 1992. We'll wait until DASD lease terminations come up or for new DASD acquisitions."

Still, customers that are

Continued on page 36

When will customers adopt Escon?



Source: International Data Corp. CW Chart: Michael Siggins

Delta loves to save, and it shows

Delta Air Lines is implementing Escon to run two data centers as one logical center, a process that should be completed by the end of next year.

"So far, we've done Escon channel-to-channel in one data center, and we have a Director," said Ron Eubanks, Delta's director of information services operations. The second data center is being built and will be occupied in the second half of this year, he said.

Eubanks said the total project will come to between $150 million and $200 million. He hopes to save about $30 million by purchasing Escon DASD and control units from third parties.

"We're waiting on the PCMs," Eubanks said. "Our biggest fear is that they won't be ready by the time we are."

Expected Escon benefits, he said, include improved disaster recovery facilities, 100% availability and the ability to "reduce the miles and miles of cabling."

Although the new data center provides a perfect opportunity to implement Escon, Eubanks said Delta would have done so anyhow. "We would have done it when we rolled over to new DASD."

One-switch support

Data Switch Corp. unveiled a switching system last week that connects Escon fiber, the traditional System/370 bus-and-tag or a mixture of both.

"There's a need to support a range of devices with one switch," said Ed Steinglass, vice president of marketing for the firm. "There will be a fairly lengthy period for a mixed environment of both fiber and bus-and-tag."

The Model 3600, with four switching and conversion modules, supports up to 128 fiber channels and control unit interfaces. It has dual power sources and local and remote control options. Prices start at $125,000.

Ed Kissinger, director of data processing at American Family Mutual Insurance, said the kind of system offered by Data Switch "will allow us to move into Escon in a managed, phased-in approach."

American Family plans to implement Escon within the next two years. "It will be done; it's just a question of when," Kissinger said.

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DG boxes auctioneer's 'old reliables'

ON SITE

BY KIM S. NASH
CW STAFF

LONDON — Dark cherry paneling, thick velvet drapes and a full-liveried doorman outside the posh King Street address of Christie's auction house exude classic reliability.

So does the auctioneer's data center.

Christie, Manson & Woods Ltd., as the 226-year-old company is formally named, has used Data General Corp.'s proprietary Eclipse MV boxes for the last 10 years. Christie's still runs the same software it developed in-house in the early 1980s.

"Our clients envision business by quill pen but still expect the kind of service they can get at a modern bank," said Andy Billington, group systems director at Christie's.

To preserve the aura of Old World tradition in its 94 offices worldwide, Christie's shrouds its DG Dasher personal computers and Eclipse terminals in wooden boxes. Hidden though they may be, those "workhorse" MVs will be around for another five years at least, according to Billington.

Despite the strong trend in the industry right now to swap proprietary systems for some form of Unix, Christie's 15 Eclipses and a few hundred DG Dashers that service 800 users worldwide do the job better than other machines might, Billington said.

How so? Scalability, he said.

Christie's runs its custom-made software on every DG machine it owns, from two large Eclipse MV/40000 series models (one in London, one in New York) to a low-end MV in its five-user Dusseldorf, Germany office.

"One could not do that on other machines," Billington said.

The core application at Christie's — a Cobol inventory/accounting program built in-house more than 10 years ago — has special provisions to account for international variations in national and local sales taxes, as well as luxury taxes and multiple currencies.

According to Billington, Christie's can get away with a smaller information systems staff than might be possible elsewhere. Because all the machines are basically the same, once IS staff are trained on one MV, they are equipped to work with other models. So Christie's saves money and time on maintenance, Billington said.

Computers fade *into the woodwork at Christie's when works like Van Gogh's Sunflowers sell for $39.9 million*

The company saves time on software development, too, by not having to migrate applications between platforms, he added.

The auction business is not like retailing or manufacturing, where goods are generally related, so a computer system has to be flexible. "It's hard to systematize coins, jewelry, furniture and art," he said.

Moreover, although Christie's has an upper echelon of repeat customers, most clients are one-time-only buyers, according to Billington. Therefore, most of the accounting and administrative data generated by several hundred auctions per year is brand new with each item sold or registered for auction.

For example, someone with a painting for sale will bring it to a local office, where he gets a receipt. Clerks then enter key information. The item is assigned to a particular auction, and bidding begins.

Once a deal is done, an on-site clerk enters the data into the system via an Intel Corp. 80286 or 80386 Dasher PC — which is housed in wood and placed out of view of the sale room.

Open systems

With many companies jumping on Unix, talk has surfaced that vendors with proprietary lines, such as DG's Eclipse, might abandon their exclusive architectures in favor of open systems. Although Christie's is one of DG's largest Eclipse users, Billington is unconcerned. More powerful MVs with cheaper millions of instructions per second hit the street regularly, he said.

However, Christie's is hedging its bets by using DG's Unix-based Aviion workstations and servers on a small scale to handle parts of the auctioneer's general ledger system.

"There were few suitable [general ledger] packages for MV, so we thought we'd try Unix," he explained.

Billington has been happy with Aviion so far, but he said Unix won't be a strong force at Christie's for at least five years, when it is "more mature."

Even then, he will not junk the MVs. "They would be included as file servers or database handlers," Billington said.

VAX 9000 users suffer headaches

BY SALLY CUSACK
CW STAFF

MAYNARD, Mass. — Digital Equipment Corp.'s mainframe headaches may not be over, according to a recent study by an independent survey firm.

According to data gathered by Reliability Ratings in Needham, Mass., customer problems appear to center around the multichip unit found in DEC's 2-year-old, top-of-the-line VAX 9000 series.

The study was completed in December, and all of the multichip unit failures reported in the survey occurred in systems installed in that year.

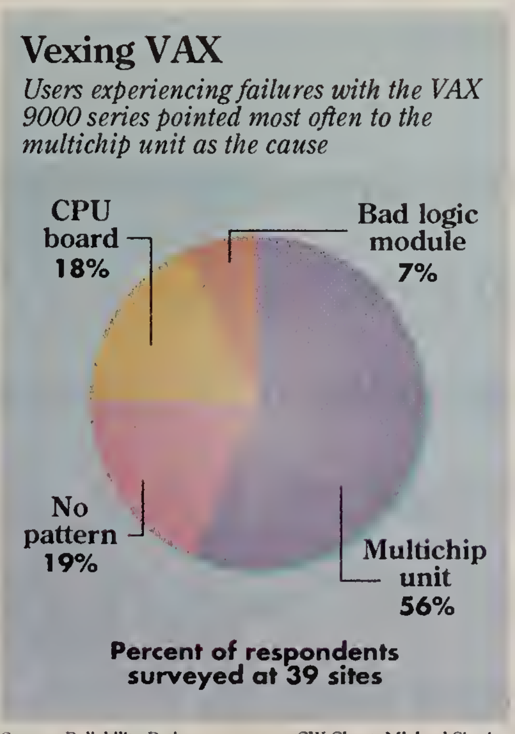
According to Reliability Ratings, almost half (48%) of the failures reported occurred in the second half of the year. About 37% of the VAX 9000 CPUs at survey sites experienced a hard failure of some type, the report said, and most of the failures were recorded on the 9420s.

The multichip units are a core technology in the 9000 systems and are comparable to the Thermal Conduction Modules used in IBM's 3090 mainframes.

DEC had experienced difficulties in the this area before but had claimed the problems were resolved via chip replacements and increased testing and burn-in periods [CW, Dec. 24, 1990/Jan. 1, 1991].

Reliability Ratings estimated there are 300 VAX 9000 systems installed worldwide and said 14% of those sites responded to the study.

The tabulated results show that more than half (55.5%) of the failures reported at the survey sites were attributed to the multichip units in systems installed in 1991.



Vexing VAX

Users experiencing failures with the VAX 9000 series pointed most often to the multichip unit as the cause

Source: Reliability Ratings CW Chart: Michael Siggins

While VAX 9000 users were reluctant to go on record concerning problems with the system, an operations manager at a large U.S.-based food processing plant said he had experienced "a high number" of failures connected with the 9000.

"A good percentage of our instability has been due to [multichip unit] failure, but that seems to be corrected," he said, adding that DEC has provided the company with a multistep, multiphase stability plan that "seems to be working."

Another VAX 9000 customer, which develops software for the U.S. Department of Defense, said DEC has had to replace two or three multichip units since the system was installed two years ago. The customer called DEC's response "impressive."

Phil Grove, VAX 9000 marketing manager at DEC, said he questioned the methodologies used for the study, as well as the size of the sample. Early problems with the 9000 were resolved through a retrofit program done on the customer's schedule, he added.

Grove also said DEC has a special task force that contacts all 9000 sites on a weekly basis. The survey data was inconsistent with information collected by the task force, he said.

Reliability Ratings gathered 247,680 run hours of history on the 9210, 9410 and 9420.

SOFTWARE SHORTS

System 3000 family to support Lucid software

NCR Corp. and **Lucid, Inc.** recently signed a joint development agreement whereby the Lucid client/server software tools can be used for software application development on NCR's System 3000 family of computers. The 3000 series of general-purpose computers is based on the Unix operating system. Lucid is a 7-year-old Unix programming software tools company specializing in Common LISP compilers.

Sequent Computer Systems, Inc. and **Texas Instruments, Inc.** have formed a marketing relationship to enable Sequent Symmetry 2000 users to run software applications developed by TI's integrated computer-aided software engineering product, the Information Engineering Facility (IEF). The alliance will enable information systems managers to easily migrate large commercial database applications to high-end Unix systems, a Sequent spokesman said. The Unix-based Symmetry 2000 series of computers incorporates between one and 30 Intel Corp. I486 microprocessors in a symmetric multiprocessing environment.

In related news, **Power Computing Co.** and TI recently announced that they will work together to provide remote computing services and consulting for TI's IEF customers. Power Computing is an international provider of computer outsourcing services for a full range of business applications on a wide variety of industry platforms.

Software 2000, Inc., a developer of business management software for IBM's Application System/400 midrange computers, has formed an alliance with **Deloitte & Touche**, the nation's third-largest professional services firm. The alliance was formed to provide complementary and value-added services to the companies' mutual AS/400 clients. Software 2000 systems will be installed at joint technology centers in New York and in Charlotte, N.C., and consulting and implementation services will be provided at these locations.

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Albert

CONTINUED FROM PAGE 29

vast majority of its customers.

But if IBM has done a creditable job of evolving SAA toward greater openness, it can't even claim a passing grade when it comes to communicating that evolution. So when most IBM customers today hear the term "SAA," they think of it as a synonym for "IBM proprietary."

Granted, with its three different levels of commonality (user-to-system, programmer-to-system and system-to-system) SAA was never something you could explain on the back of a business card. As it kept expanding and evolving, SAA became even harder to describe to the layman. And the more open SAA became, the more IBM's competitors had a stake in perpetuating an image of SAA that was strictly vintage 1987.

The result is that many of IBM's customers today use and like major product elements of SAA — MVS, DB2 and yes, OS2 — but remain skeptical about the architectural underpinning that makes them all perk.

What's not to like about SAA? The consistency? The connectivity? The more than 90 implementations of national and international standards?

Before SAA, IBM's user interface was the C: prompt. Today, even Microsoft's Windows is built around SAA's Common User Access definitions. And CUA '91, announced in September, already defines the object-oriented interfaces the industry will be moving to.

Even if you agree that the perception of SAA (proprietary and limiting) is out of sync with its reality (open and evolving), that still leaves IBM with a big decision. Should it try to do a better job of communicating about SAA or just stop talking about it and focus on the openness that it provides? If the September announcement is any indication, IBM is already moving toward the latter.

But if IBM drops SAA as a selling point, it will certainly not stop pushing its evolution as an architecture. A car company can choose whether to talk about its engines, but it can't afford to stop improving them.

> WHAT'S NOT to like about SAA? The consistency?

That brings us to IBM's reorganization. With an increasingly open SAA as the common blueprint for the company, all the free-spirited entrepreneurial development that the reorganization is supposed to unleash can happen, and the resulting products will still work together at the end of the day.

By that measure, SAA could be more important to IBM than ever. Just don't expect it to say so.

Albert is president of Sam Albert Associates in Scarsdale, N.Y.

No stampede to IBM's Escon

CONTINUED FROM PAGE 29

building new data centers or consolidating or remodeling existing ones, such as Delta Air Lines in Atlanta (see story page 29), are prime Escon candidates, analysts said. Already, some 25% of the installed base is Escon-capable, said Bob Neidig, IBM's program manager of systems introduction in Somers, N.Y. However, he said, only about 200 customers are actively using Escon.

"Each customer devises their own migration strategy," Neidig said. Some attach their DASD units to Escon with a converter, which IBM has been giving to customers for free and will continue doing so until at least June. Other customers opt for the full-blown approach, installing the Director, which provides switching benefits.

Another motivation for users adopting Escon this year will likely be the pricing competition that arises when third parties, including Hitachi Data Systems Corp. and Amdahl Corp., make available their competing Escon controllers and DASD devices during the second and third quarters. At least one third party, Data Switch Corp. in Shelton, Conn., has already begun delivering an Escon switching device (see story page 29).

TISC's Callery said the ultimate "stick" from IBM will come in a few years, when all of the firm's high-end peripherals will be Escon-only and will no longer work with the standard parallel adapters.

"By that point, most shops won't care because they will have already gone to Escon. But for the stragglers, it will be the last knock on the head."

NEW PRODUCTS — SOFTWARE

Unix software

Precision Visuals, Inc. has announced its PV-Wave Point & Click product for Sun Microsystems, Inc. workstations running Open Look and Motif windowing systems.

PV-Wave Point & Click is a visual data analysis software package for nonprogrammers. It allows quick graphical interpretation of large amounts of data, according to the firm.

A single floating license costs $4,500.

Precision Visuals
6230 Lookout Road
Boulder, Colo. 80301
(303) 530-9000

Utilities

IBS Conversions, Inc. has enhanced its Translator software tools for converting mainframe and CICS applications to the IBM Application System/400 midrange platform.

Additional language translations include RPG II to RPG/400 and Cobol Report Writer to standard Cobol 85.

IBS Conversions
2625 Butterfield Road
Oak Brook, Ill. 60521
(708) 571-9100

Ricomm Systems, Inc. has improved its Rtape/400 backup and restore software.

New functions include object backup and restore, improved tape label exits, on-the-fly database backup and restore and group profile security support. The software also supports multiple processors.

The new version costs $3,499 until March 31, and $4,999 thereafter.

Ricomm Systems
1 Eves Drive
Marlton, N.J. 08053
(609) 596-9027

Demax Software, Inc. has released new versions of its Detective security software products.

System Detective 2.1a includes enhancements to the Automated Operations module, with greater flexibility for rules-based response to system events, and the Interactive Session module, which now allows the systems manager to close a user's session with a single keystroke. The Chalktalk Help desk module now supports up to 256 concurrent user sessions.

Pricing for System Detective ranges from $245 to $10,600, depending on central processor. Chalktalk costs between $245 and $3,900.

The company also upgraded its Connection Detective network tool, which analyzes traffic at the packet level and isolates faults.

Pricing is $4,800 for the first local-area network segment and $3,600 for additional segments.

Demax Software
Suite 500
999 Baker Way
San Mateo, Calif. 94404
(415) 341-9017

BMC Software, Inc. has announced the availability of Copy Plus for DB2 Version 3, Release 1.

The high-speed copy utility offers increased performance and support for multiple copy statements and multiple data set nonpartitioned table spaces. A table space validity checking function is also included.

Tiered pricing for a perpetual license starts at $12,000.

BMC Software
Box 2002
1 Sugar Creek Center Blvd.
Sugar Land, Texas 77487
(713) 240-8800

Applications packages

Lucas Management Systems, Inc. has announced Artemis 9000/EX, an enhancement of its project management software for IBM mainframes.

The software is redesigned to exploit recent changes in the MVS and VM operating systems, according to the company. It requires 30% less system resources and features improved applications development functions, including an enhanced Artemis-SQL interface and a new interactive structure editor with automatic roll-up processing.

The product costs $33,435 per user for a three-user license.

Lucas Management Systems
Suite 350
12701 Fair Lakes Circle
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ComputerWorld P-1

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PC & WORKSTATION SHORTS

Microsoft upgrades

Microsoft Corp. has announced an updated version of its Project Windows, including a multipage preview that lets users see the entire project at a glance as well as a new project tool bar for one-click access to common tasks. Version 3.0 of Project Windows is slated to ship Jan. 31 and will retail for $695. Upgrades will cost $145.

PI Systems Corp. in Portland, Ore., established itself as an early frontrunner in providing the lightest, lowest priced pen-based personal computer last week, when it announced Infolio. The model weighs 2.9 pounds, costs $1,895 and can squeeze up to 12 hours of power out of six AA batteries, company officials said. Shipments are scheduled to begin in March.

Lotus Development Corp. started shipping a development kit for its Ami Pro word processing software recently. Release 1.0 of the Macro Developer's Kit is targeted at third-party and corporate developers. It includes tools to customize Ami Pro 2.0 and build associated applications.

Firms seek safety in leased portables

BY MICHAEL FITZGERALD
CW STAFF

Leasing a computer is not a new thing or a big deal, and leasing a personal computer is less common; however, leasing portables may make a new mark in the rapidly changing world of portable computing.

PCs are generally seen as being "small-dollar, small-ticket" items, so unless somebody leases 1,000 or 2,000 of them, the benefits of leasing may not show up, said Thomas J. Donovan, a director at Technology Investment Strategies Corp. (TISC) in Framingham, Mass.

Donovan and other analysts said they have seen little indication that companies are turning more to PC leasing because corporate accounting practices do not justify leasing desktop machines. Portables are another story.

Therefore, "especially with notebooks and laptops because of their limited expandability, I think people are a little more wary of gaining a machine that's going to be obsolete," said Erik S. Blom, a senior analyst at TISC. Blom cited new, high-capacity 2½-in. hard drives and color screens as some of the innovations that are "making people think twice about a purchase because things are happening so quickly, and they don't want to buy things that will be obsolete in a hurry."

At least some users agree with this.

At Hyundai Motor America, for instance, the company began leasing its portables after it purchased eight Compaq Computer Corp. SLTs for a pilot project. Compaq released the LTE 286 notebook soon thereafter — a major technological advance — and when Hyundai moved ahead with its portable project [CW, Jan. 6], it moved to leasing.

"We decided [portable] technology would keep changing, so it would be more prudent for us to start leasing and figure that it's a three-year useful life for the product, and at the end of three years we could go with whatever the newest, lightest, fastest machine around was," said Carrie M. Ulvestad, national manager of dealer communications at Fountain Valley, Calif.-based Hyundai.

Hyundai's experience with leasing has been positive enough that it decided to lease desktop machines as well, Ulvestad said. Last month, it swapped out 155 IBM PC ATs and replaced them with leased Intel Corp. 80386-based Hyundai PCs. Ulvestad said the Hyundai name was a factor in the decision, but the main impetus was the deal it received on the clones. She said IBM could not match the deal, even with its trade-in program.

"We plan to lease from here on out because of the useful life of the technology [being so short]," Ulvestad said. She add-

Continued on page 44

Laptop leasing issues

Pros:
- Obsolescence avoided.
- Savings on up-front costs.
- Less cost overall.

Cons:
- No depreciation cycle.
- Machines not kept.

Customers planning groupware strategy to parallel Lotus' Notes

BY ROSEMARY HAMILTON
CW STAFF

Some Lotus Development Corp. customers are currently expanding their groupware strategies with the company's Notes software as a central component.

"From my standpoint, their strategic view was well-rounded," said Craig Goldman, chief information officer at The Chase Manhattan Bank NA in New York. "They delivered a lot on Day 1, and they've been very professional to make it a better product."

Lotus introduced Notes in 1989 as work-group software designed to provide communications and information management functions to groups of users working on local-area networks. Earlier this month, the firm committed to providing expert-system-like functions and multimedia capabilities for Notes in the next 12 months.

Chase Manhattan has 1,600 Notes users today and plans to add another 2,000 licenses this year, Goldman said. The software provides a key piece to the company's work-group strategy, he added.

Goldman said he hopes to include multimedia functions in Notes as they become available. The company has a number of Notes-based applications, including one that tracks customer accounts. Chase has piloted some basic imaging capabilites with the customer system and hopes to implement "industrial strength" imaging capabilities with it.

Eventually, Chase workers could use Notes to maintain customer files that could consist of various media formats, Goldman said. "It could start with a word processing document on the cus-

Continued on page 44

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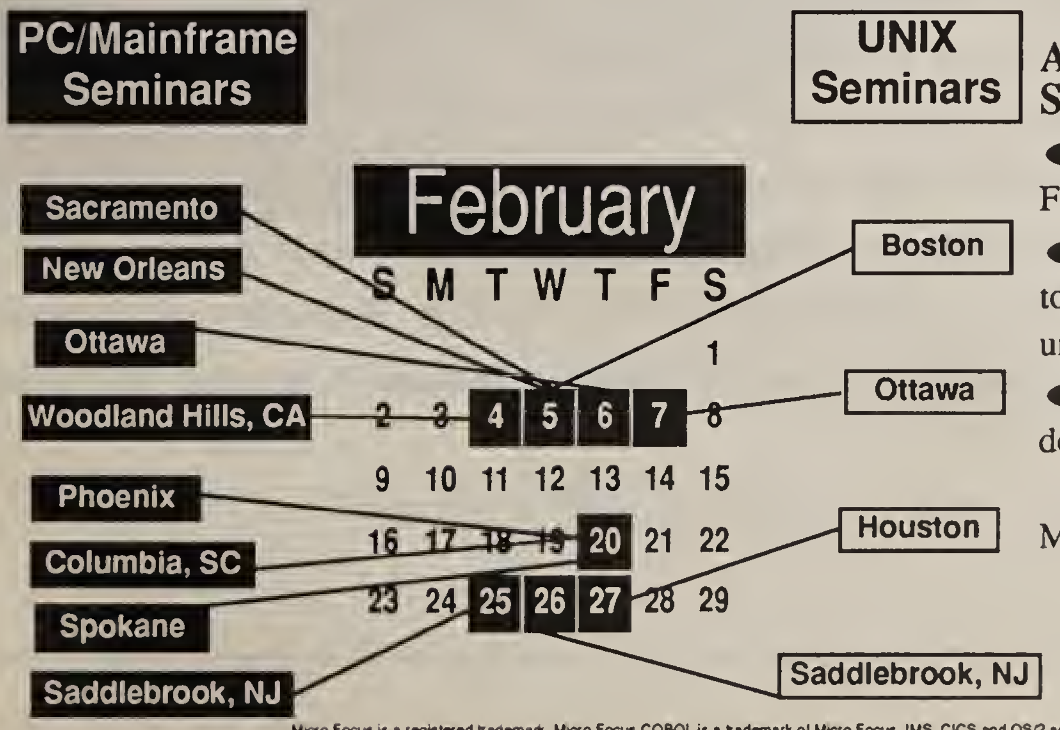

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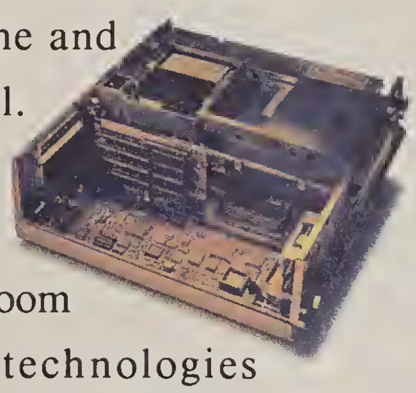

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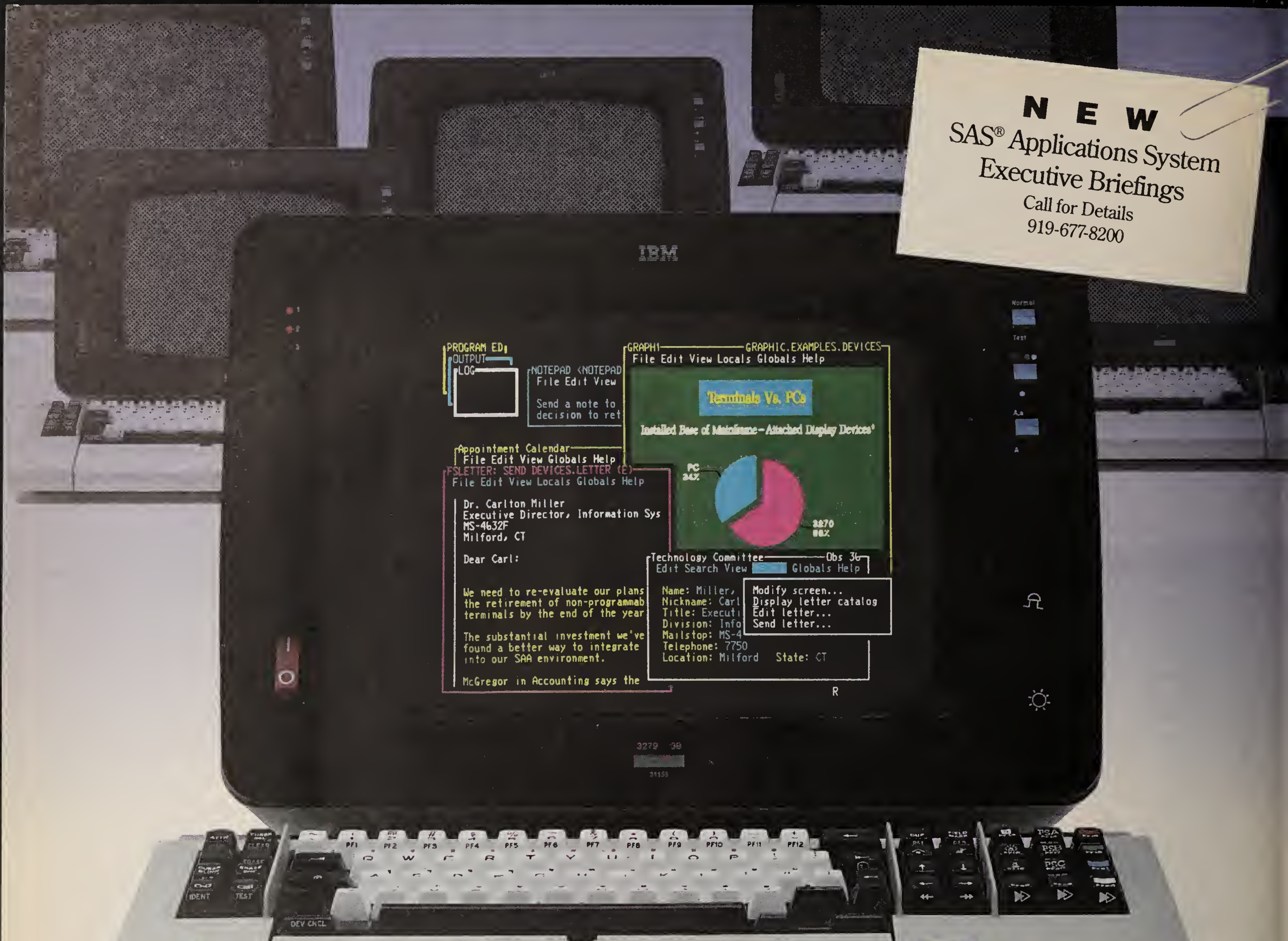

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GIS vital in utility's duel with competitor

ON SITE

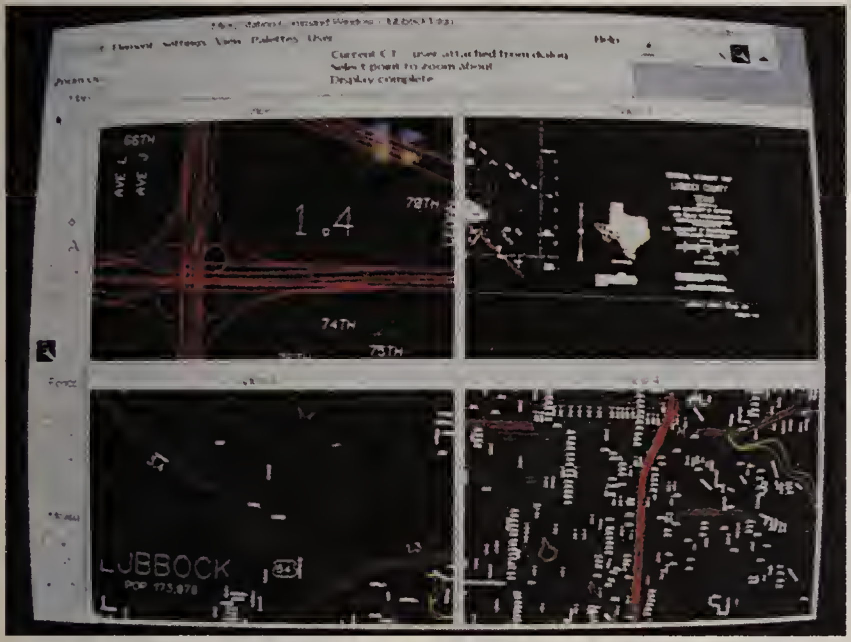
BY CAROL HILDEBRAND
CW STAFF

There's feuding in the Lubbock, Texas, utility corral, and one of the contenders, Lubbock Power and Light (LP&L), is counting on a quick draw with its computers to attract more customers to its side of the fence.

LP&L invested in a modular geographic information system from Intergraph Corp. that, when fully installed, will not only map the company's utility and sewer lines more accurately but will also enable the firm to woo new customers. The city-owned utility is in the unusual position of having competition in town, and sparks are flying as LP&L vies for customers with Southwest Power Service.

Out of a population of 186,000, about 45,000 light up their lives with the town-run firm, and 65,000 avail themselves of its water resources. According to Tom Tuning, MIS manager for the city of Lubbock, a big selling point with the city was the fact that the utility could improve its customer service and add to its flock.

"Being able to identify which household is on what system is pretty important, particularly in the event of a power outage," he said. With two companies competing for customers, it is not unusual to find one house in the dark and its next-door neighbor with the floodlights on.



Computerized maps *of electric meter locations can show Lubbock Power and Light which houses have lost power in an outage*

Prior to the system's installation, the only way to tell who was on what was to examine the meter at each location. With a map of electric meters superimposed over a base map of the city, LP&L will be able to pull up an on-line map that highlights which households are powerless in the event of an outage. With work orders tied into the system, the map is automatically updated when a meter is switched.

Another big plus for LP&L will be to get the utilities off the outdated paper mapping system they currently use. The graphical database includes a survey of poles, substations and various components of the electrical system in Lubbock.

"Before, every time something changed, we would have to redraw the map by hand," Tuning said. "Now, we can just replot." When it comes to issuing work orders, workmen can now go to one of the three plotters scattered across the city and plot instant directions off the designated corner of the map.

Tuning said the information systems department is building an Oracle Corp. text database — handling customer information such as names, addresses and power used — that will be connected to the graphical database. "One of the reasons we chose Intergraph is that their software allows you to use several different types of SQL databases, including Oracle," he said.

Tuning said the biggest problem he has run into concerns putting base maps of the city onto the system. Electrical and water maps will then be overlaid by each utility, which will work from the same set of base maps.

Tuning said the city is aiming for a high degree of accuracy with the base maps and that much twiddling with the maps will be needed.

"Electric and water utility maps don't have to be real accurate — you just have to know the relative position of the lines," he said. However, since the city engineering department will eventually end up on the same system, the maps need to be pinpoint precise. "Otherwise, you could end up with a street running through somebody's house," Tuning said.

The system is currently run on two Intergraph reduced instruction set computing-based workstations — one in each section of the utility — connected via fiber-optic Ethernet. In place since August, the project is not quite one-third of the way completed, Tuning said.

With eight people currently trained out of the approximately 45 that will eventually be using the system, the utility has already run into overcrowding. The water department could already stand to have two to three more workstations, and Tuning said Lubbock's city engineers, the Planning Department and the computer-aided dispatch service (911) will eventually be added to the system.

Application links Macs, Microsoft SQL server

BY JAMES DALY
CW STAFF

BOCA RATON, Fla. — Apple Computer, Inc. Macintosh users received another interoperability boost recently when Techgnosis, Inc. introduced the first product that delivers the full functionality of Microsoft Corp.'s SQL server directly to Macintosh applications.

Sequelink is a set of client/server-based software components that Macintosh users can use to obtain direct real-time access to the SQL Server — Microsoft's OS/2-based database server. The newfound Macintosh-to-SQL Server connectivity is good news for users who have been hoping something would bridge the gap between the two platforms.

"We've been waiting for Microsoft to develop Named Pipes for the Mac, but that doesn't seem like it's going to happen," said Greg Frankenfield, MIS manager for research and development at General Mills, Inc. in Minneapolis. Frankenfield said he was trying to run Blythe Software, Inc.'s Omnis 5 database across both Macintosh and OS/2 platforms. Named Pipes is used to connect DOS machines to SQL Servers.

Using Sequelink, virtually any feature that can be utilized in a local SQL Server database session is available from within a Macintosh application. Sequelink also uses the standard Appletalk networking protocol.

Others supported

In addition to the Macintosh, Sequelink supports a variety of Windows, OS/2 and Unix applications, including Visual Basic and Lotus Development Corp.'s 1-2-3 spreadsheet. For developers using third-generation languages such as C and Pascal, Sequelink also includes application programming interfaces and object libraries that enable Sequelink commands to be incorporated into their applications.

Sequelink requirements include any Macintosh running System 6.0 or above; Localtalk; a Token Ring or Ethernet connection to the OS/2 Server; LAN Manager Release 2.1 or later; Microsoft's LAN Manager Services for the Macintosh; and Microsoft's SQL Server Release 1.1 or later.

Single copies of the Sequelink client software for the Macintosh are $295. Server software costs $1,495, including the SQL Server Link and the LAN Manager Network Link.

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COMMENTARY

Jesse Berst

What Windows NT is and is not

This spring, IBM will be revving up its PR machine for OS/2 Version 2.0. Since Windows New Technology (NT) is Microsoft's answer to OS/2, you can expect the noise level to rise in Redmond as well. In fact, I've learned the companies are plotting "dueling booths" at the Comdex/Spring '92 show.

I'd like to explain what NT is, what it is not, and why it is important for some of you to start considering NT right now.

It's tempting to advise you to wait before you do anything. After all, OS/2 2.0 won't ship at least until March, and Windows NT isn't expected until year's end.

But it isn't that simple these days. If your company uses leading-edge technology to gain a competitive advantage, you need to plan ahead. And NT is an option you should consider.

NT is not a new flavor of DOS or an update to the Windows graphical user interface. It's not supposed to supplant Windows on desktop PCs. Rather, it was designed to provide a highly compatible operating system for servers and high-end workstations.

Designed to accommodate these high-powered machines, NT is a brand-new, 32-bit kernel-based operating system with multiple emulation subsystems. Translation: It's a modern, high-performance operating system that can run on more than one platform and can run more than one kind of interface.

Why should IS professionals care about a new operating system? Because the old one isn't good enough.

"Users have voted with their pocketbooks for the Windows interface," said a systems engineer at a major oil company, "and that's where all the applications are. Windows/DOS is OK for the desktop — but not for downsizing line-of-business apps."

Compatibility, performance

The problem, then, is to find an operating system that can supply compatibility and high-end performance. Let's see what NT has to offer:

- **Portability.** NT isolates the hardware with a Hardware Abstraction Layer so that it's easier to move it to different processors. In the beginning, NT will support the Intel 386/486 platform and the Mips R3000/R4000 RISC platform (including the new Decstation 5000 line).

With a portable operating system, you can run the same interface and the same software on different machines. That gives you mix-and-match flexibility. Best of all, your programmers are able to write to a single interface and a single programming model.

- **Compatibility.** In theory, NT will support your old DOS and 16-bit Windows applications, plus 32-bit applications written specifically for NT. It will perform this sleight of hand with emulation "wrappers." In addition, it will support three file systems (DOS, OS/2 and one of its own) so that you won't have to reformat your hard disks to use NT.

In theory, NT will provide a painless upgrade path that preserves your software investment. In practice, it's not that easy to make one operating system emulate another. Indeed, Microsoft engineers are already starting to back off from their DOS compatibility claims.

Still, it seems reasonable to expect that NT will be at least as compatible as OS/2 2.0, since the NT engineers only have to walk down the hall to get internal details about DOS.

- **Robustness.** Windows is prone to crashes that bring down the entire system. The forthcoming Windows 3.1 fixes many of these problems. NT is even more robust than 3.1, insulating applications from one another.
- **Power.** NT is a full 32-bit, multitasking operating system that supports symmetric multiprocessing. I've seen NT up and running on a four-processor NCR machine. Multiprocessing will be important for real-time transaction processing and other exacting applications.
- **Connectivity.** NT will support a wide variety of networking protocols, so you won't have to rearchitect your existing networks. Basic peer-to-peer services will be built into Windows NT. A special server edition will provide client/server capabilities for those who need them.
- **Security.** Access control lists and other security features are built right into the operating system.
- **Robust error and exception handling.** NT should make programs more reliable and easier to test because it supports exception handling.

Those are some of NT's most important goals. The next question is, "Can Microsoft deliver?"

Schedules met so far

So far, so good. Microsoft has met most of its internal schedules and has just shipped a second beta-test version of its Software Development Kit. I've talked to dozens of programmers who've seen it. So far, they're impressed.

Still, there's no denying that Microsoft has a history of delays. Obviously, you shouldn't plan a wholesale shift to NT until it's actually shipping. But you should consider testing it, especially if 1) you already have a fundamental commitment to the Windows interface; 2) you think 32-bit technology is significant for your future; 3) staying ahead technically is important to your competitive stance.

Microsoft has confirmed that major corporations are taking part in NT beta testing. You may want to do the same.

Berst is the publisher of Redmond, Wash.-based "Windows Watcher" newsletter, a monthly briefing service for software executives and corporate technology managers.

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Safety in leased portables

CONTINUED FROM PAGE 39

ed that the company did a lease-vs.-buy analysis and found little difference between the two options but picked leasing because of technology issues.

Baxter Microscan, a Sacramento, Calif.-based division of Baxter Healthcare Corp., also turned to leasing notebooks because of fear of using obsolete technology.

Baxter Microscan has 60 Compaq LTE 386/20 Model 60s distributed among its North American field representatives. Originally, the company bought the portable IBM Convertible.

"They were obsolete soon after we bought them, but we used them well past their useful technical life because they were on the books," said Steven Keck, director of information resources at Baxter Microscan. Keck said many of the representatives abandoned the Convertibles rather than continuing to them.

So Keck turned to leasing six months ago because "we didn't want to fall into the trap of having a computer we were going to be depreciating over five years.

"When it came to laptops, we've been bombarded by new announcements every month, so we wanted our representatives to have state-of-the-art equipment without losing flexibility for our organization," Keck said.

Customers use Notes in strategy

CONTINUED FROM PAGE 39

tomer then grow to include a spreadsheet that is the analysis [of the account]," Goldman said. "Then it may be an image of [documentation] that is not conveniently available."

Peoplesoft, Inc., which sells payroll and personnel software, is using Notes to add another level of support for its customers, according to Rick Bergquist, vice president of technical services.

Notes is used as the internal electronic-mail system as well as a hot line management system. Customer data is stored in Notes, and staff members can view that data from different perspectives. "You can define your own forms and fields and then set up views to look at data any number of ways," Bergquist said.

"Hot line people look at it in terms of account status," he said, "and managers want to see it in terms of work load."

Bergquist said the next goal is to provide a copy of Notes to customers so they can communicate directly with the support personnel.

In addition, the company hopes to establish for customers a bulletin board that can function as a service database. The idea would be to maintain common problems and solutions so users could consult Notes to resolve routine technical glitches, Bergquist said.

At Price Waterhouse, which installed Notes in 1989, the software is emerging with a key role in the firm's client/server strategy, said Sheldon Laube, national director of information and technology.

"It's the most widely used product in the company," Laube said.

IDC
INTERNATIONAL DATA CORPORATION

White Paper

uniVerse: DELIVERING A MATURE Unix APPLICATION ENVIRONMENT

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Introduction

Unix, in its many guises and ever-changing forms, is a complex technology for even the most skilled Information Systems (IS) department. At a time when IS budgets and payrolls are shrinking, mastering Unix becomes even more difficult. And just as there is no denying the complexity of Unix, there is also no denying its staying power.

One way to harness that power while taking advantage of existing systems is to implement uniVerse, a native Unix application development environment which enables software developed in the Pick environment to work on any Unix system. uniVerse users can use their existing software or choose from a suite of 4,000 other mature applications.

uniVerse also offers a conducive environment for developing new Unix-based applications. It includes a three-dimensional database file structure, data dictionary and query language. In its native Unix environment, it allows developers to take advantage of Unix features, including the full range of software tools, communication options and front-end technologies.

Despite its strengths, uniVerse still faces some obstacles. Like Pick, it suffers from a lack of name recognition. It also needs to reach new markets. VMark Software, Inc., which produces uniVerse, must continue its largely successful efforts to market to VARs and systems integrators while stimulating applications development from new sources.

Succeeding in an open systems IS environment is another challenge for VMark. So far it has implemented in uniVerse such standards as Posix, Motif, X and TCP/IP. In order to fully enable connectivity with other heterogeneous databases, the company is actively implementing appropriate standards specified by the SQL Access Group.

uniVerse is currently at a crossroads. VMark expects continued growth in its traditional business and if uniVerse is thoughtfully developed to meet a wider range of user needs, it will be a productive partner of Unix for the long term.

This White Paper was written independently of the *Computerworld* editorial department by International Data Corporation.
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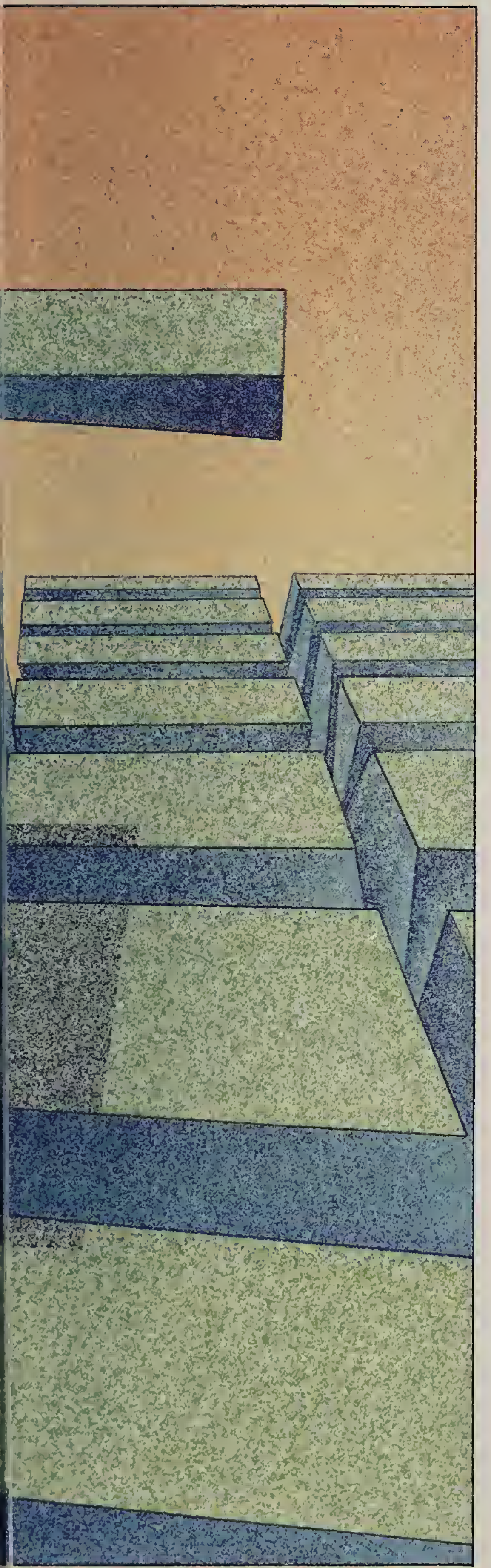
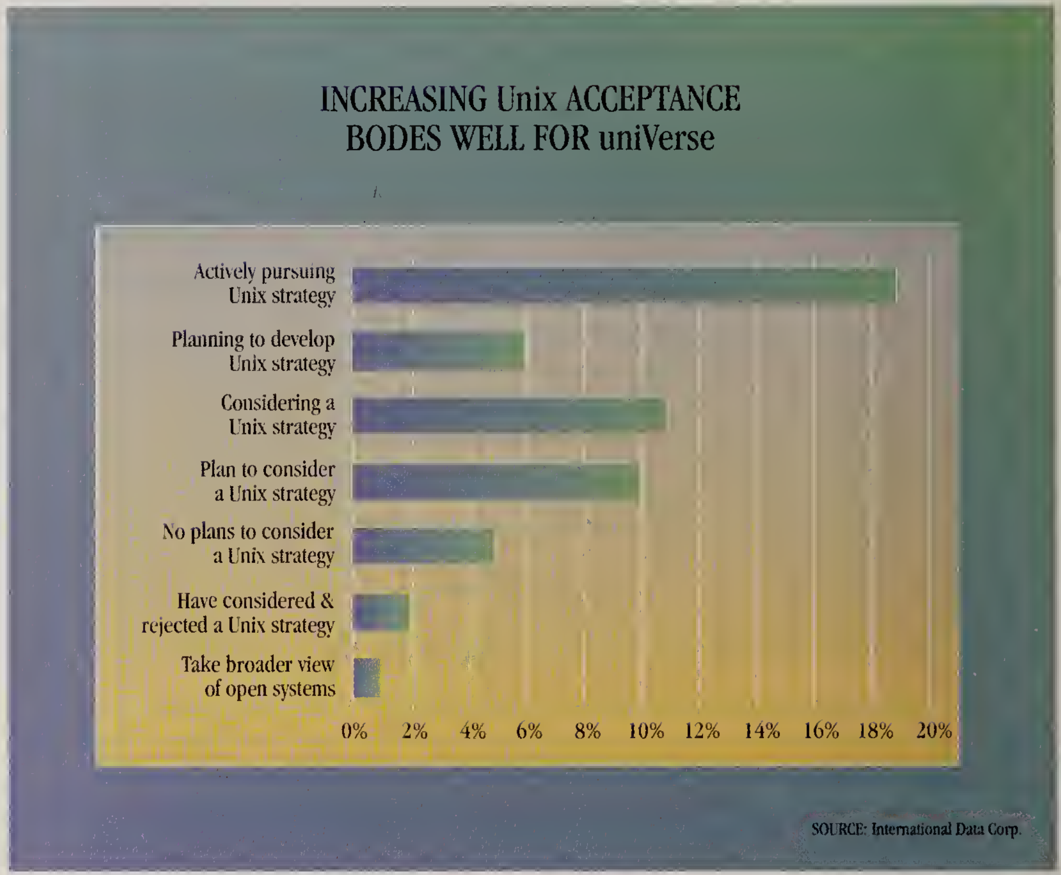


uniVerse: DELIVERING A MATURE Unix APPLICATIONS ENVIRONMENT

THE RESULTS OF A RECENT INTERNATIONAL DATA CORP. (IDC) SURVEY OF 249 MULTI-USER COMPUTER SYSTEM SITES REVEALS THAT 80 PERCENT OF THOSE SITES WILL ACQUIRE ONE OR MORE ADDITIONAL MULTI-USER SYSTEMS WITHIN THE NEXT THREE YEARS. FURTHERMORE, 59 PERCENT INDICATE THEY WILL BE OFFLOADING APPLICATIONS FROM THEIR CURRENT SYSTEMS TO THESE NEW MULTI-USER SYSTEMS.* ■ NOT SURPRISINGLY, Unix IS IN A POSITION TO FLOURISH IN THIS DYNAMIC COMPUTING ENVIRONMENT. ALMOST HALF (46 PERCENT) OF THE SITES SURVEYED BY IDC SAY THEY ARE CONSIDERING Unix TO SOME DEGREE. USERS WHO WISH TO REALIZE THE BENEFITS OF Unix SYSTEMS AND A MATURE SUITE OF APPLICATIONS MAY DO WELL IN CONSIDERING uniVerse, A NATIVE IMPLEMENTATION OF THE PICK ENVIRONMENT IN Unix. ■ THE PICK ENVIRONMENT HAS BEEN REGARDED BY A KNOWLEDGEABLE FEW FOR OVER 20 YEARS AS AN EFFICIENT PLATFORM FOR DEVELOPING AND DEPLOYING APPLICATIONS THAT

* TWO HUNDRED OF THE 249 SITES INDICATE THEY WILL BE EITHER ACQUIRING NEW MULTI-USER SYSTEMS OR OFFLOADING APPLICATIONS AND/OR ACTIVITIES TO NEW MULTI-USER SYSTEMS. THE 200 SITES CONSISTED OF TWO GROUPS OF 50 SITES CONSISTING OF IBM 3080/3090 AND DEC VAX 6000/8000 SENIOR SYSTEMS, AND FOUR GROUPS OF 25 SITES WITH WANG, UNISYS, PRIME AND DATA GENERAL SYSTEMS.



Almost half (46%) of sites surveyed by IDC indicate an interest in acquiring Unix. Many of these sites are potential uniVerse users.

unfortunately ran on its own proprietary operating system. In following the growing acceptance of Unix in the commercial marketplace, VMark Software, Inc., of Natick, Mass., has taken Pick's application development and delivery environment and implemented it in Unix in the form of uniVerse.

Thus uniVerse is the product of merging the strengths of Pick — an integrated database/file manager, a data dictionary and a query language — with those of Unix, which has multi-vendor support across multiple platforms.

Why implement a native Unix version of Pick? Because Pick, like Unix, was developed over 20 years ago, and offers a mature environment with many available applications. Via its compatibility with Pick, uniVerse has access to over 4,000 applications developed exclusively for that environment. This allows VMark to focus its energies on offering the best possible product, an application design, development and delivery environment (AD^{3}E), while other vendors with operating systems' expertise deliver the Unix operating system component.

What are the components that make up uniVerse and why is uniVerse a good AD^{3}E? The major components of uniVerse include the following Pick-compatible elements: database; file manager; query language; command language; processor (i.e., shell); BASIC compiler and run-time environment, and distributed database support.

DATABASE AND FILE MANAGER

While VMark has implemented the Pick Application Programming Interface (API) for uniVerse, the database and file manager system is the cornerstone of uniVerse. The benefits of doing a complete emulation of the Pick file system on Unix are twofold. First, as far as the application and the developer are concerned, the file system has not changed. System data is still accessed in the same way. Second, because the files created by uniVerse are normal Unix files, standard utilities may access them, and special disk partitions do not have to be created. Unix commands such as CP (copy), MV (move/rename), and TAR (tape archive) all work on uniVerse files. In addition, third-party backup and system administration utilities all work on uniVerse files.

In a business environment, the size of the data sets may be constantly changing. uniVerse allows for the space allocation of files to be dynamically modified without system operator intervention. High- and low-water triggers may be created so that file size is changed automatically when the number of records reaches either of the triggers.

The uniVerse database management system relies heavily on data dictionaries. A data dictionary is a file that is defined and created by the application developer, and stores "metadata". Metadata may be best thought of as data describing the data. Because the data elements within uniVerse are typeless, the data dictionary contains information on how specific functions operate on the class of data in question.

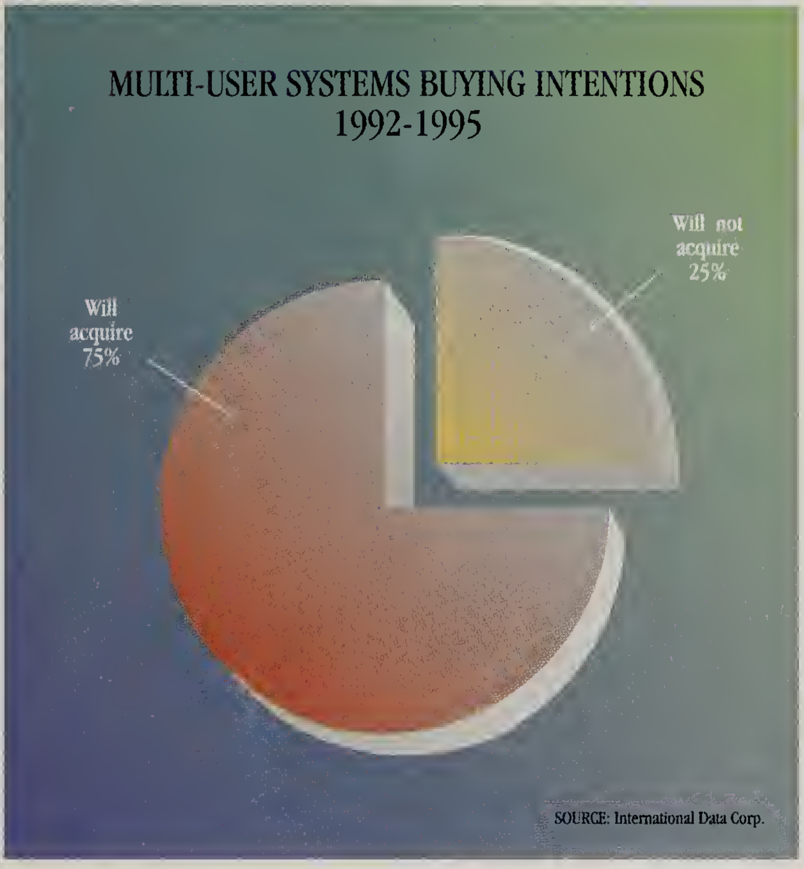
RETRIEVE, a standard part of uniVerse, is its database manager and report writer/query language. RETRIEVE has both English-like semantics and syntax. The main structure behind RETRIEVE is the sentence. In the same way English has sentences consisting of nouns and verbs, RETRIEVE has sentences composed of the user's data (nouns) that are operated on by verbs that are provided by RETRIEVE. Each sentence may then be stored as part of a vocabulary file.

COMMAND LANGUAGE AND PROCESSOR

While its database and file manager is the heart of uniVerse, the command language and processor are the elements most visible to the users. If the system administrator wishes, uniVerse's command language may be as close to the computer as the user ever gets. uniVerse's usefulness is further enhanced by its site-expandable command language that allows users to expand it to meet their individual needs.

The vocabulary (VOC) file is the keystone of the command language and processor. The VOC file contains descriptions of the verbs, key words and files that are available to the uniVerse user. The contents of the VOC file make up the command language. The command processor uses the VOC file to interpret each of the commands as they are entered by users. As is the case with Unix shells, VOC files allow users and/or system administrators to customize the environment. And, as is also the case with Unix's "aliasing" facility, the system administrator may add verbs that, in turn, represent a longer command string.

uniVerse also provides command histories. As with Unix, a predetermined number of instruction lines is maintained in a list. In the case of uniVerse, up to 99 instruction lines can be kept. In the uniVerse vocabulary, each line is a sentence and is stored in the VOC file. Users may then tie together a series of two or more sentences to make a paragraph which, in turn, is stored in the VOC file. Both sentences and paragraphs can be given nicknames. The nicknames are used to execute the actions within the sentence or paragraph. By starting with the smallest components of the command language, users can build a customized language within uniVerse that meets their unique needs.



SOURCE: International Data Corp.

IDC expects the trend of sites acquiring new multi-user systems and the gains in the acceptance of Unix to spur demand for uniVerse.

PROGRAMMING LANGUAGE

BASIC is the primary programming language for the uniVerse system. However, uniVerse's BASIC is about as close to the interpreted BASIC language used for teaching as a Porsche is to a Model T. While there are some similarities, such as ease of use, uniVerse BASIC is designed for application development. The non-uniVerse BASIC is intended to be a teaching language and not to write commercial applications.

While uniVerse does provide an editor for developing BASIC programs, developers are free to use other editors. Experienced Unix developers will likely opt for VI or EMACS, though any editor that can read and write ASCII files is acceptable. uniVerse's use of ASCII files for programs permits developers to use both Unix and third-party application development utilities such as Source Code Control System (SCCS).

While VMark's BASIC is compiled, it is not compiled in the common sense of the word. Rather than producing executable binary files, the uniVerse BASIC compiler produces an intermediate token stream. It is this token stream that is executed by the BASIC environment. Because the token stream must be interpreted each time the program is executed, it is not as efficient as machine language. However, it is much more efficient than an interpreted environment. Once the program has been compiled, it may be executed with the familiar RUN command.

While the intermediate code is not true object code, uniVerse developers can treat it as such. A program may be catalogued with uniVerse. Catalogued programs are advantageous as they can be called from other code segments and they facilitate the reuse of the code segments.

DISTRIBUTED DATABASE SUPPORT

Information systems installations are distributing their databases across a multitude of platforms. Some sites have worked off a carefully planned schedule. Other sites are forced into distributed environments as departmental and personal systems are added to their networks. As a result, many users do not know or care where their data physically resides. Their overriding concern is that they be able to transparently access the data when they need it.

uVnet is uniVerse's distributed database access scheme. This optional product, using the de facto standard Transmission Control Protocol/Internet Protocol (TCP/IP), permits easy access to data that may be distributed over multiple systems running uniVerse.

VMark has simplified the process of communicating with remote file systems by eliminating the need to provide the full address and file name each time a remote file link is established. A user may insert an entry, which serves as a nickname to the remote file, into the VOC file. Once the VOC file entry is created, the user may refer to the nickname through both command line entries and BASIC programs.

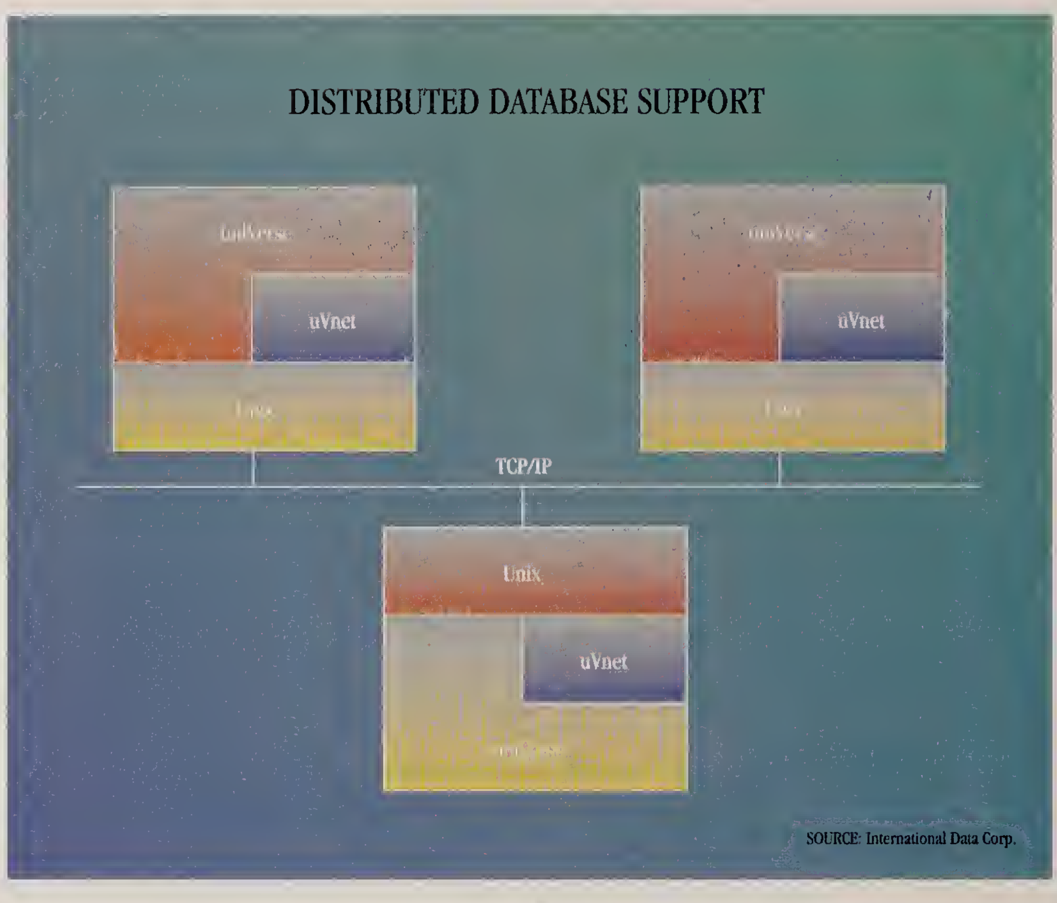
uniVerse's FUTURE

The sites responding to IDC's survey say they do not rely heavily upon VARs and external consultants, which are the leading distribution channels for uniVerse. This is not necessarily bad news for VMark. While the company has its share of large system sites, it is not primarily targeting large firms with internal programming expertise. Instead, it chooses to deliver turnkey software solutions to small-to-medium user sites that lack the ability to write or rewrite programs internally. Clearly, less customized, packaged software solutions based on the more than 4,000 commercially available Pick applications are VMark's mainstays.

VMark must remain extremely aggressive in its efforts to induce Pick developers to port their products to uniVerse. Actually, many uniVerse sites indicate that "port" may be the wrong word in migrating Pick applications to uniVerse. Rather than recounting horror stories of multiple-month or even multiple-year porting periods, many user sites talk of overnight and weekend changeovers.

As Pick sites weigh alternatives to their current Pick environments, Pick/Unix combinations are being considered along with relational database management systems or object-oriented databases. In order to keep their current customers, software houses with Pick applications should support uniVerse.

The port to uniVerse is a "win-win" situation for both software houses and their customers. For the software houses,



SOURCE: International Data Corp.

Its uVnet function permits uniVerse to communicate with uniVerse databases on other systems.

uniVerse-based products are easily moved from one Unix system to another and they are compatible with a wide range of systems. This compatibility is also an advantage for buyers who may move applications from system to system as hardware platforms change.

In addition to being an application delivery platform, uniVerse is also an application design and development platform. This bodes well for uniVerse, as the IDC survey finds that just under half of the surveyed sites develop their own application software internally.

CASE STUDY: A.M. MILLER

When Bruce Bachman came to A.M. Miller and Associates, Inc., a credit and collections firm, just over a year ago, it was obvious to him that the current Pick software running on a proprietary platform was inadequate and running out of capacity. The situation was so bad that the firm was on the verge of turning away business.

A.M. Miller had been using a Pick Environment for over seven years. According to Bachman, the firm wrote its own accounting and tracking software and was determined to protect that investment. As soon as the decision was made to migrate to a new hardware platform, A.M. Miller chose Unix because it was "universal".

As a Pick user, the firm needed a Pick-compatible software system that ran on top of Unix. After an evaluation of different Pick emulators, Bachman selected what he considered to be the best of the Unix-Pick environments. VMark's uniVerse was implemented in conjunction with Strategic Alternatives, Inc., a Detroit-based VMark distributor. It was implemented on a new DECSystem 5500 running Ultrix.

"We had an overnight conversion," states Bachman. Before that happened, however, he and his staff wisely did a dry run to detect problems. Problems were found. They consisted of differences in syntax between their old Pick system and uniVerse. Once the differences in the syntax were detected, his staff reprogrammed source code and the problems were resolved. What became the overnight conversion could then be done. "We didn't lose a day of business," Bachman declares.

At last count, A.M. Miller is supporting 205 concurrent users on its uniVerse/DEC System. A.M. Miller's business hours run from 7:00 a.m. to 11:00 p.m., with peak demand coming in the late afternoon. In spite of the heavy loads placed on it, the uniVerse/DECSystem remains stable.

Bachman's staff of nine includes three programmers who are responsible for new development and maintenance. Bachman says that, despite beliefs that experienced Pick/uniVerse programmers are hard to find, he has not had a problem finding them.

Bachman's approach to uniVerse and Unix has been a fairly traditional play on the strengths of both components. He uses uniVerse as a platform for both application development and delivery. Unix is employed for connectivity and system management. Bachman says that A.M. Miller also recently linked an Ethernet with six PCs to its DECSystem.

CASE STUDY: OCEAN COUNTY LIBRARY

The Ocean County Library, based in Tom's River, N.J., is typical of organizations that are completely dependent on VARs and systems integrators for their systems. The library's David Slater indicates that his institution's Hewlett-Packard 9000/857S supports 230 users. Regarding uniVerse and Unix, he says he is happy to realize the benefits of both without having to access the inner workings of either.

Ocean County Library is in an envious position. It is able to rely on one vendor, Dynix, Inc., to provide software that, when written on top of uniVerse, permits ease of use for over 200 users. Dynix is solely focused on turnkey applications for libraries. Using this uniVerse/Dynix solution, the library is not forced to develop costly internal expertise.

SUPPORT FOR CRITICAL COMPONENTS

uniVerse has many of the capabilities sites surveyed by IDC rate as either critical or highly desirable. Survey respondents say the three leading requirements for application development environments are: a query language (63 percent), connectivity to other databases (57 percent) and distributed databases (44 percent).

uniVerse meets that first requirement with RETRIEVE. However, while uniVerse does offer database connectivity via uVnet, it is currently only across different uniVerse platforms.

IDC believes that some corporate

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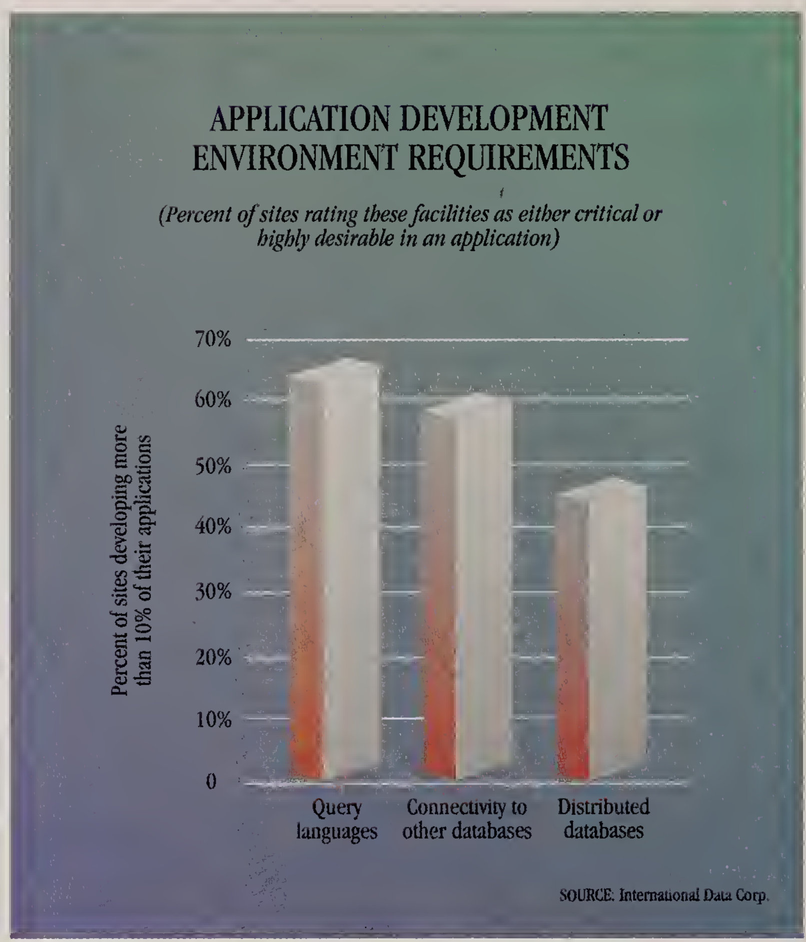
DIGITAL. THE OPEN ADVANTAGE.

mainframes, be they small-scale systems supporting 12 users or large-scale systems supporting over 200 users, may come to act as database servers in addition to performing their other duties. This change combined with the increasing amounts of data on remote systems will drive the demand for database connectivity through at least the mid-90s.

VMark understands that this connectivity will require it to offer a standardized Structured Query Language (SQL), as well as give the uniVerse-based system the ability to participate as a member of a heterogeneous network. To this end VMark is following the lead of the SQL Access Group, which was formed to address compliance with the group's standards, as they become available.



SOURCE: International Data Corp.

uniVerse includes a standard query language and optional distributed database capabilities.

A major strength of uniVerse is in its ability to promote the development and delivery of vertical applications in an effective and timely manner. This has been the case since the inception of uniVerse, and its strength in this area has recently been enhanced by the implementation of user-oriented features such as the Motif-style graphical user interface capability for PC look and feel, transaction logging and recovery for data integrity, and distributed database capability for today's ever-broadening topologies. These features serve to contemporize what uniVerse (and before that, Pick) solution providers have done successfully for a long time. These people bring to the user the ability to tailor their software to operate consistently with business requirements rather than the reverse. Most of VMark's 150 VARs have either a vertical or functional (such as systems integration) specialty. As uniVerse continues to move into open systems and embraces these standards, this customer-oriented expertise will be focused squarely on the open systems user.

One of the common beliefs regarding Pick-like systems is that it is difficult to find developers that are familiar with the environment. As a native Unix application, uniVerse has skirted this issue because developers work with Unix, not Pick, if and when they need to access the operating system.

VMark proposes using Computer-Aided Software Engineering (CASE) tools to generate applications. However, if this is the plan, VMark must be able to provide methodologies that are accepted across a wide variety of platforms, be they databases or operating systems.

IDC believes VMark's support of SoftBench technology as developed by Hewlett-Packard is correct. SoftBench technology allows users to pick and choose SoftBench-compliant products from various vendors to assemble a CASE environment that meets their specific requirements. IDC believes that established CASE vendors with SoftBench-compliant products, such as Interactive Development Environments and Cadre, would be appropriate partners for VMark to establish relationships with. SoftBench technology is available or announced on HP, Sun and IBM Unix platforms and is expected to be announced for other platforms this year.

SUMMARY

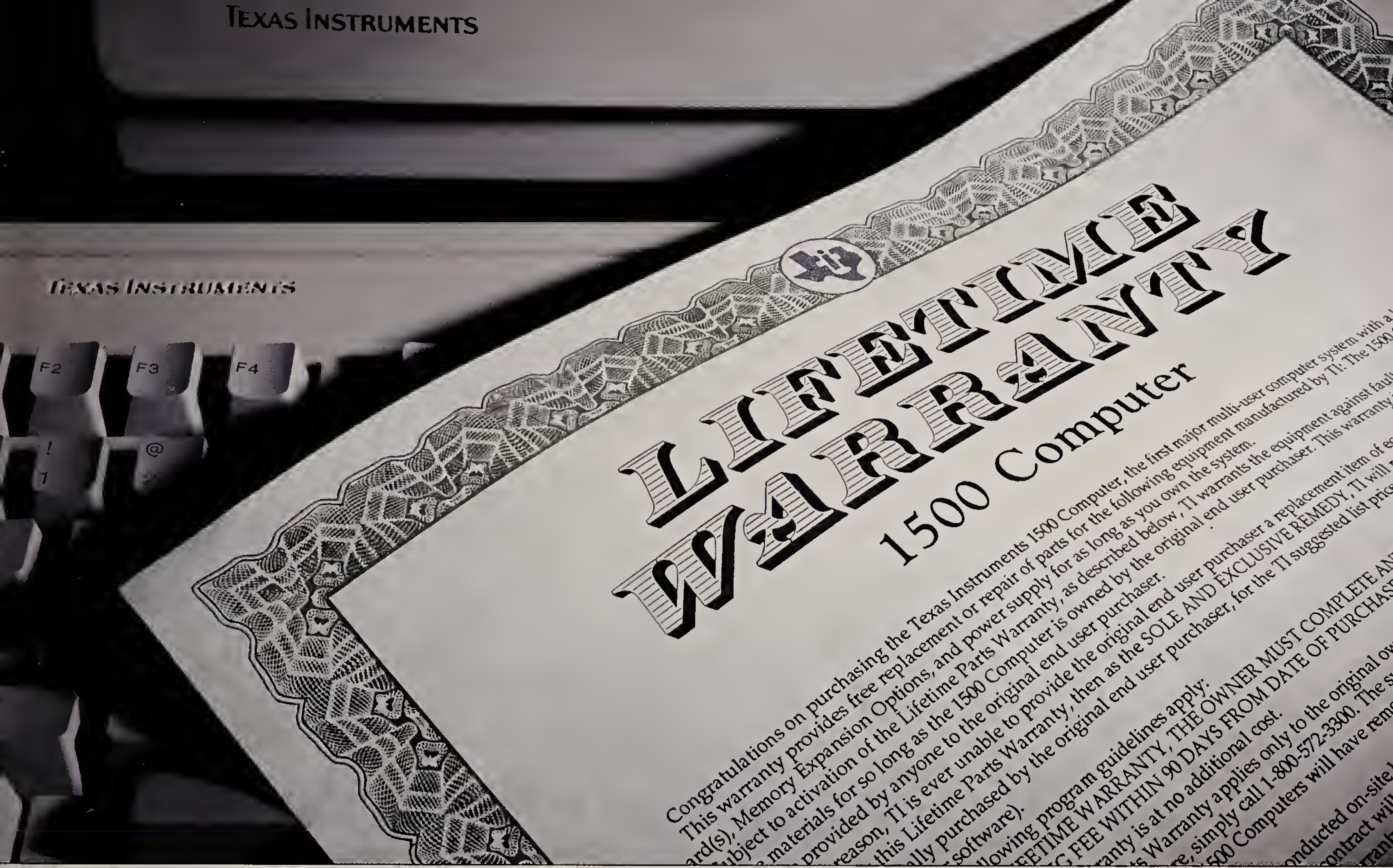
IDC believes that uniVerse is positioned to play a meaningful role in the ever-expanding Unix market. Users that are looking for turnkey applications are well advised to consider a uniVerse-based application. Considering the fact that some Pick-based programs that can run on uniVerse have been evolving for over 15 years, it would be hard to find such mature and functional applications elsewhere.

Despite its advantages, however, uniVerse still faces some challenges. VMark must persuade VARs, IS software developers and potential users that uniVerse has staying power and will continue to evolve along with Unix. In order to stimulate ongoing application development, VMark must educate them regarding uniVerse capabilities in the open system environment.

VMark must employ three strategies. First, it must continue to successfully cultivate the developers of the more than 4,000 Pick applications. These people should be encouraged to keep porting to uniVerse, and to actively update their software by implementing the latest technology that Unix has to offer. This will keep the company 's lifeline of mature solutions evolving and flowing.

Secondly, in order to cultivate new solutions, VMark must realize that not the whole world will speak uniVerse. As it would not be practical to support all of the various dialects of SQL at this time, VMark is correct in taking direction from the SQL Access Group.

Finally, VMark should align with one or more major third-party CASE vendors. This will bring the prestige of these vendors into the equation, and produce faster and easier transitions for first-time uniVerse developers.



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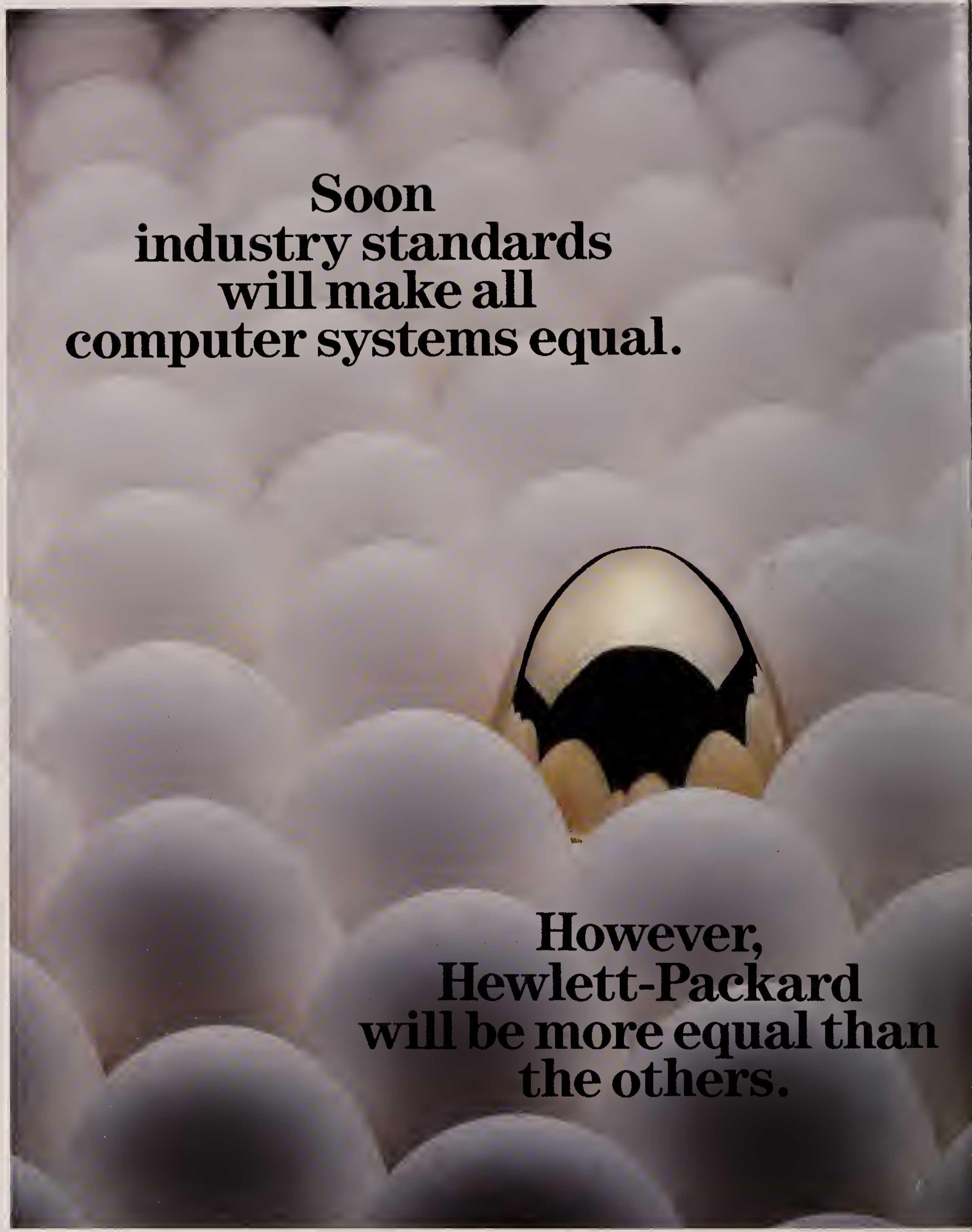
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Digital Research's DR DOS 6.0 out-DOSes DOS

Technology Analysis — A roundup of expert opinions about new products. Summaries written by freelance writer Suzanne Weixel.

DR DOS 6.0, the personal computer operating system from Digital Research, Inc., a wholly owned subsidiary of Novell, Inc., beats Microsoft Corp.'s PC-DOS 5.0 at its own game, reviewers said.

Memory/file management: DR DOS makes better use of memory and is able to borrow Video Graphics Array random-access memory to increase available memory.

Ease of use: Viewmax, the graphical shell, gives non-Windows users color schemes and directory tree displays. Reviewers reported difficulty installing DR DOS 6.0 on a system that uses OS/2 1.2's dual boot.

Utilities: DR DOS includes many utilities that MS-DOS users must get from add-ons. Also, Taskmax, the task switcher, supports up to 20 applications and lets users cut and paste data between applications.

Windows support: There are compatibility problems between the Superstor utility and Windows, and some Windows modes preclude DR DOS's memory-saving ability.

Value: DR DOS 6.0 offers virtually 100% compatibility with MS-DOS 5.0. DR DOS 6.0 lists for $99.

Digital Research's DR DOS 6.0

Reviews	Memory/File management	Ease of use	Utilities	Windows support	Value	Overall
Infoworld 9/16/91	Impressive — better than DOS	NC	A number of new capabilities	A mixed bag	Costs same as DOS upgrade	Fills DOS user's wish list
PC Magazine 11/12/91	Improved	Easy to install	Extra features	NC	A big price improvement	Improves on features
PC Computing 11/91	Optimizes for maximum memory	NC	Adds new features	NC	Impressive	Tops DOS at everything
Users						
Mark Fenno, N.Y. Dept. of Health	■■■■	■■■■	■■■■	■■■	■■■■	All you need in DOS
Hugh Bayless, Monterey Bay User Group	■■■■	■■■■	■■■■	■■■■	■■■■	Excellent
Ric Seymour, A U.S. government agency	■■■■	■■■■	■■■■	■■■	■■■■	Super task switcher
Analysts						
Earl Rich, Faulkner Technical Reports	■■■■	■■■■	■■■■	■■	■■■■	Nice DOS alternative
Amy Wohl, Wohl Associates	■■■■	■■■■	■■■■	■■■	■■■	Worth looking at
Peter Francis, Dataquest, Inc.	■■■	■■■■	■■■■	■■	■■■■	Great value

Key: ■■■■ Very good ■■■ Good ■■ Fair ■ Poor Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. NC: No comment.

Vendor financial ratings

Analysts	Long-term stability	Short-term performance
Rich Edwards, Robertson, Stephens & Co.	■■■■	■■■■
Mary McCaffrey, CJ Lawrence	■■■■	■■■■

Novell, Inc. acquired Digital Research, based in Monterey, Calif., for $80 million in October 1991. Digital Research had revenue of $40.9 million. Ratings are for Novell, which had increases of 29% in revenue and 72% in income in 1991.

Digital Research responds

Ken Pomper, product manager:

Ease of use: IBM has certified OS/2 with DR DOS 6.0.

Windows support: An update issued last month fine-tuned the default installation to help users optimize their systems for Windows support. In addition, we now offer a 50-page booklet with optimization and configuration tips.

Norton Desktop: Better Windows than Windows

The Norton Desktop for Windows from Symantec Corp. provides tools that make Microsoft Corp.'s Windows more powerful and easier to use, reviewers said.

Program/file management: The package replaces Windows' Program Manager and File Manager with an integrated operating environment that offers flexible program launching and file manipulation. Capabilities include group file handling, batch processing and the ability to view multiple drive or directory listings simultaneously. The program uses 3M to 4M bytes of disk space beyond what Windows requires; loading and unloading can be sluggish.

Utilities: Other than a calendar and a phone dialer, users will be hard put to find a worthwhile utility not included. There are graphical versions of Norton Backup, Disk Doctor, System Information and Batch Builder as well as an icon editor and library, screen saver, file shredder and key finder.

Ease of use: The Desktop interface is colorful, intuitive and customizable. One minor shortcoming is that users must manually arrange icons on the Desktop for program launching.

Windows compatibility: The package provides keystroke and mouse uniformity with Windows.

Value: If you have Windows, you should have Norton Desktop for Windows, reviewers said. It lists for $149.

Symantec's Norton Desktop for Windows

Reviews	Program/File management	Ease of use	Utilities	Windows compatibility	Value	Overall
Infoworld 9/2/91	Excellent	Very good	A slew of extras	NC	Excellent	8.8*
PC Week 8/5/91	Makes Windows more powerful	More intuitive	Graphical versions of classics	NC	One of the best bargains	Something for every user
PC Magazine 9/24/91	Rich integrated environment	Brand-new face for Windows	An amazing collection	Supports Windows MDI	Cost-effective	Magnificent
PC Computing 8/91	Unified environment	Macintosh-like desktop	Makes program a lot easier	NC	The bargain of the decade	The way to compute with Windows
Users						
Jim Ferguson, Company name withheld	■■■■	■■■	■■■■	■■■	■■■■	Nicely integrated
Jim Vigotty, Mutual of Omaha	■■■■	■■■■	■■■■	■■■■	■■■■	Best buy there is
Harvey Rose, Shearson Lehman Brothers, Inc.	■■■■	■■■■	■■■■	■■■■	■■■■	Worth the money
Analysts						
Peter Francis, Dataquest, Inc.	■■■■	■■■■	■■■■	■■■■	■■■■	Better than Windows
Amy Wohl, Wohl Associates	■■■■	■■■■	■■■■	■■■	■■■■	A no-brain decision

Key: ■■■■ Very good ■■■ Good ■■ Fair ■ Poor Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. NC: No comment. **Infoworld* ratings based on 1-to-10 scale.

Vendor financial ratings

Analysts	Long-term stability	Short-term performance
Peter Rogers, Robertson, Stephens & Co.	■■■■	■■■■
Mary McCaffrey, CJ Lawrence	■■■■	■■■■

Symantec reported revenue of $52.6 million for the second fiscal quarter of 1992, ending Sept. 30, 1991. Net income totaled $2.4 million for the quarter. Revenue increased 74% over the same period in 1991.

Symantec responds

J. J. Schoch, Windows product manager for Symantec/Peter Norton Products Group:

Program/file management: As a Windows enhancer, it may seem to use a lot of disk space, unless you consider all the extras you get. In fact, because all the utilities that come with The Desktop share libraries, they take up at least 20% less disk space than if they were purchased separately.

NEW PRODUCTS

Systems

Commax Technologies, Inc. has lowered the prices on its Ultrathin notebook computers.

Ultrathin systems include an Intel Corp. 20-MHz 80386SX processor, weigh 4½ pounds and stand 1¼ in. high.

With a 60M-byte hard drive, the notebook costs $2,795. An 80M-byte version costs $2,995.

Commax Technologies
2031 Concourse Drive
San Jose, Calif. 95131
(408) 435-5000

Opus Systems, Inc. has started shipping a 40-MHz upgrade kit for its Personal Mainframe Scalable Processor Architecture workstations.

The 40-MHz motherboard raises Personal Mainframe performance to 29 million instructions per second, the company reported. The kit also includes Sun Microsystems, Inc.'s Solaris 1.0 operating system, along with documentation and installation instructions.

The kit is priced at $4,195.

Opus Systems
329 N. Bernardo
Mountain View, Calif.
94043
(415) 960-4040

Software application packages

Aldus Corp. has announced upgrades of its Persuasion presentation software packages.

Persuasion 2.1 is available for both the Microsoft Corp. Windows and Apple Computer, Inc. Macintosh platforms. The Macintosh software supports Apple's Publish and Subscribe feature and Quicktime technology. The Windows software now supports Dynamic Data Exchange and features enhanced performance.

Both versions include the Persuasion Player, a runtime application for distributing and viewing Persuasion slide shows independent of the actual Persuasion software.

Persuasion 2.1 costs $495; upgrades are $50.

Aldus
411 First Ave. South
Seattle, Wash. 98104
(206) 622-5500

Zsoft Corp. has begun shipping Photofinish, an image-editing software package for Microsoft Corp.'s Windows environment.

Photofinish ($199) edits scanned photographs and drawings. It can export edited images into presentation graphics, desktop publishing and word processing files.

Zsoft
Suite 100
450 Franklin Road
Marietta, Ga. 30067
(404) 428-0008

Database management systems

Natural Language, Inc. has produced an updated version of its English language-based querying tool for relational databases.

Natural Language Release 5.0 features a menu-driven interface for accessing graphics, data analysis and reporting functions. It also incorporates on-line help and improved reporting capabilities.

The software now supports a number of Unix workstations as well as personal computers running The Santa Cruz Operation, Inc.'s SCO Unix, and Digital Equipment Corp. VAX systems. Support for DOS and Sun Microsystems, Inc.'s Solaris operating system will be added.

Pricing starts at $4,500 on low-end desktop platforms.

Natural Language
2910 Seventh St.
Berkeley, Calif. 94710
(510) 841-3500

Check out the Product Showcase on Page 104

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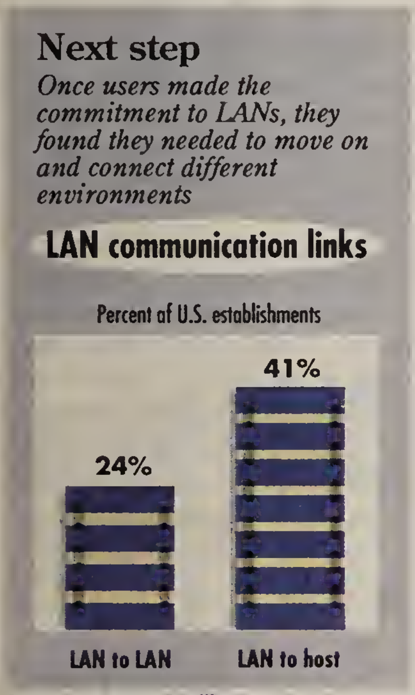
Internetworking product demand booms

BY JOANIE M. WEXLER
CW STAFF

Revenue projections for the internetworking market continue to spiral, as firms feverishly add segments to their corporatewide communications networks.

The appeal of users gaining access to applications anywhere on an enterprisewide network has caused worldwide router revenue to jump from $224 million in 1990 to $470 million in 1991, according to a recent report from Needham & Co., a New York investment analysis firm. The firm expects those figures to hit $1.6 billion in 1994.



Next step

Once users made the commitment to LANs, they found they needed to move on and connect different environments

Source: Computer Intelligence
CW Chart: Janell Genovese

The report showed that the total internetworking equipment market reached $588 million in 1990, a 57% increase over 1989. That market includes bridges, which are less expensive than routers. Bridges accommodate all protocols but offer less functionality in terms of security and diverse routing. They handle LAN-to-LAN communications, while routers move data directly from one node to another.

The internetwork market also comprises gateways, which are necessary for converting data formatted in one protocol into the format of another. Gateways handle node-to-host, LAN-to-host or LAN-to-LAN communications.

Needham & Co. cited the desire of Fortune 1,000 firms to speed internal communication and externally exchange business documents as the major impetus behind internetworking products' continued growth.

Half the battle

However, Barry Gilbert, director at Computer Intelligence/Infocorp, an Acton, Mass.-based research firm, warned that installing equipment is only half the battle for companies expecting a hefty return on their internetworking devices.

Often, companies "don't go the last mile in helping employees gain an understanding of all they can do with the information," he explained. "We tend to put in the linkages but then usually leave it up to individuals to learn how to use them."

In a recent report, CI/Infocorp estimated that more than 40% of organizations with local-area networks have implemented a LAN-to-host gateway (see chart) and that 49% of companies with more than two LANs have installed interconnectivity devices among them.

The Needham & Co. analysis placed highest internetworking growth in the early 1990s in multiprotocol routers to accommodate the hodgepodge of networking environments now in existence.

However, one user bent on migrating her firm to open systems said she views multiprotocol routers as somewhat of a hindrance to the Open Systems Interconnect (OSI) nirvana. "The current set of multiprotocol routers are patching or fixing problems rather than moving us to a consistent communications infrastructure that facilitates the sharing of information between any systems," said Laurie Bride, manager of communications technology at Boeing Computer Services, Inc. in Seattle.

Up and running

Boeing is running proprietary protocols, such as Novell, Inc.'s IPX and Digital Equipment Corp.'s Decnet, "on top of an OSI transport as a first step to get us to a clean end-to-end communications backbone," Bride said.

John Krick, an analyst at Datapro Information Services Group in Delran, N.J., said he considered Bride's comments "a unique perception. There are currently not enough well-developed OSI products to support that kind of move."

"Vendors and users can't be faulted for taking advantage of what existing technologies afford them," particularly in an era of fiscal belt-tightening, he said.

A recent Datapro survey of nearly 600 network professionals revealed that vendor reputation and support rated No. 1 on user lists of internetworking purchase criteria.

Small firms unite through net

Semnet provides independent manufacturers with big-company access

BY GARY H. ANTHES
CW STAFF

COLUMBIA, S.C. — A government, industry and university partnership has set up a test network linking South Carolina manufacturing firms and technical experts at state colleges and universities. The partnership hopes to expand the network to other Southeastern states and eventually to the entire U.S., forming a manufacturing information infrastructure that will allow small and medium-size firms to compete in national markets.

According to Paul Huray, director of the High Performance Manufacturing Consortium and senior vice president for research at the University of South Carolina, the nation's 355,000 small manufacturers are isolated, lacking ways to exchange technical information with suppliers, customers and technical experts.

"They're not competitive, but they don't know it. They market to the city they're in and that's it," he said.

Basic struggle

Even quite large manufacturing firms typically lack manufacturing telecommunications systems, Huray said. They are struggling to implement the basics of electronic data interchange, and their private, intracompany networks are dominated by financial applications. As a result, they lack the ability to easily tap into the national pool of qualified parts suppliers, he said.

Huray's answer to those problems, called Southeast Manufacturing Network (Semnet), will bring technology and customers to manufacturers while conveying manufacturers' capabilities and bids to buyers around the U.S. The network will eventually be able to support voice, data and video in both synchronous and asynchronous modes, Huray said.

At present, Semnet occupies a part of Suranet, a university-sponsored regional network spanning a dozen Southeastern states at 1.5M bit/sec., soon to be 45M bit/sec. Semnet ties together the members of the High Performance Manufacturing

Continued on page 62

Telecommuting project keeps HP execs in-house

BY ELISABETH HORWITT
CW STAFF

Faced with the danger of losing key sales executives to a two-way 1½ commute, Hewlett-Packard Co.'s Western region sales center manager, Barry Ross, responded by offering some managers the chance to work at home four days a week. In addition to discouraging valuable personnel from heading out the door, Ross said he expects the telecommuting project to result in productivity gains and cost savings in the hundreds of thousands of dollars.

HP's worldwide human resources committee signed off on the project last month, and six to 10 salespeople will participate in a pilot this year.

As much as 50% of the Western region's telesales force will eventually participate, and the idea is very likely to spread to other divisions, Ross said, adding, "There isn't a person here who isn't excited about this."

Maintaining sales force

Based on an internal study, Ross said he expects telecommuting to induce salespeople to stay four or five years in their jobs, compared with the current three-year average. This in turn will mean significant savings on the cost of training new employees, which comes to $60,000 to $80,000 per person for the first year of employment at the division, Ross said.

Ross said he expects the program to result in hundreds of thousands of dollars in additional sales per person per year by lowering the division's frequency of hiring an inexperienced person to replace a departing senior salesperson.

HP executives who signed off on the project were reassured by the fact that the Western division had in place "very specific metrics" for measuring telesalespeople's performance, whether or not they worked in the office or at home, Ross said. Criteria include sales performance, call performance, customer satisfaction and quality of data entries. Employees whose performance falls below a certain level can lose the right to telecommute or their jobs, he said.

Janell Genovese

Each telecommuting salesperson's home office is equipped with a 386 HP Vectra personal computer running a sales software package from Brock Control Systems, Inc. in Atlanta. Salespeople maintain customer account profiles on the PC and at night send updates on accounts, including new orders, in batch mode over dial-up lines to an HP 9000 minicomputer, also running Brock software, at the region's telesales center.

Salespeople, who sell the full range of HP products, also access the minicomputer to exchange electronic mail, call up the latest prices and availability of products and put together quotations for customers, Ross said.

Salespeople do most of their work on a local PC, minimizing the time they have to spend linked to the center's minicomputer. Equipment for each telecommuter comes to approximately $5,000, including software, a PC, two phone lines and a fax modem.

Compuserve brings monthly fee on-line

BY ELLIS BOOKER
CW STAFF

COLUMBUS, Ohio — Compuserve is now allowing subscribers to its on-line information network to opt for a flat monthly fee of $7.95 for about 30 information services. Until now, users have paid per-minute rates for the majority of Compuserve's offerings.

The move brings the nation's largest on-line service in line with pricing schemes used by at least two of its competitors: Genie, run by General Electric Information Services; and Prodigy, a joint IBM and Sears, Roebuck and Co. venture. The two services have monthly flat rates of $4.95 (non-prime time), and $12.95, respectively. The rate does not include access to Compuserve's software and hardware forums.

Prodigy introduced the concept of a flat monthly fee when it went on-line in October 1988.

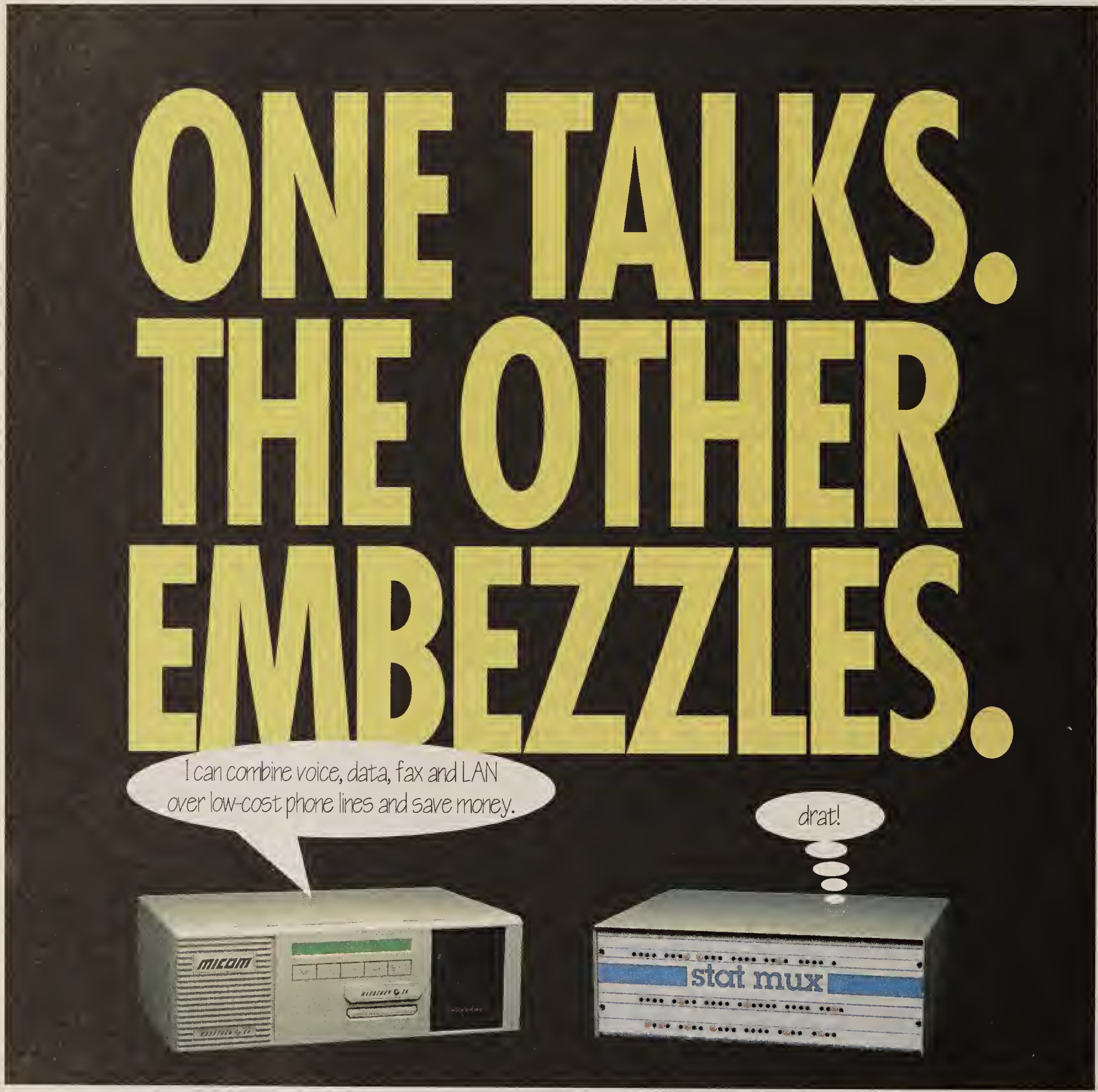
"I think [Compuserve's move] was a response to the marketplace," said Lorraine Sileo, editor of "IDP Report," a weekly newsletter on the electronic information industry published by Simba Information, Inc. in Wilton, Conn. "Customers are looking for predictability and want some kind of handle on their spending."

Compuserve said current members will be able to sign up for the option first, and that most new members after March 1 will use the so-called basic service plan.

Includes E-mail

Electronic mail, one of the top applications of on-line networks, is included in the new pricing package. Reading all incoming mail is free (except from Internet), and users can send the equivalent of 60 three-page messages. Above this monthly limit, users will pay 15 cents for the first 7,500 characters and 5 cents for each additional 2,500 characters.

Frank Glaser, an assistant district attorney in New York who signed up with Compuserve only a month ago, noted that some of the "basic" services are already free of connect charges. Nevertheless, he was enthusiastic about the new rate structure.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AT&T, CLI show desktop videophones

AT&T recently introduced a mass-market videophone for use on the public telephone network. The $1,500 Videophone 2500 sports a 3.3-sq-in. color LCD and shows motion at 10 frame/sec. It will be available in AT&T Phone Center stores and department stores this summer.

Last week at the Macworld Expo in San Francisco, Compression Labs, Inc. (CLI), which provided the video compression technology for AT&T's unit, introduced a videophone system for the Apple Computer, Inc. Macintosh and Integrated Services-Digital Network (ISDN).

The Cameo Personal Video System, Model 2001, is described as CLI's first in a family of desktop video solutions.

The Model 2001 operates at 128K bit/sec., allocating 64K bit/sec. of the ISDN Basic Rate Interface line for audio and 64K bit/sec. for video.

CLI said future products will support IBM Personal Computers and analog phone networks; other products will be compatible with the AT&T Videophone and CLI's dedicated videoconferencing systems, the company said.

The Cameo system, which will be available this spring, will retail for $2,095, or $1,595 without the camera module.

The latest development in Enterprise Networking in two words:

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Small firms unite through net

CONTINUED FROM PAGE 59

Consortium: the Southeast Manufacturing Technology Center (SMTC), the University of South Carolina, the South Carolina Research Authority, 16 South Carolina technical colleges, General Motors Corp., Digital Equipment Corp., IBM, United Technologies Corp., Kendall Square Research Corp. and 370 South Carolina manufacturers.

SMTC, which leads the consortium, is funded by the U.S. Department of Commerce, the University of South Carolina and corporations. SMTC member companies come to it to learn of the latest manufacturing technology, for training and for help developing and implementing business plans. They can also offload power-hungry computer-aided design and manufacturing (CAD/CAM) applications from their personal computers to a DEC VAX 6440 vector processor at SMTC.

Tip of the iceberg

Those capabilities require rather modest network and computer resources at present, but the consortium has much more in mind. It wants manufacturers to be able to exchange product design specifications — including three-dimensional images — electronically, and to have low-cost, interactive, multimedia communications capabilities with companies across the U.S.

The consortium is developing an electronic bidding board, initially for the U.S. Department of Defense (DOD) but eventually for other large parts buyers as well. Buyers will post requests for bids, and Semnet users will then download the associated specifications and drawings to see if they want to go after the business. Bids, award notices and additional manufacturing specifications would be sent back over the network.

Huray said the electronic bidding system will help ensure conformance to military specifications, will reduce both government and vendor costs and could shorten procurement lead time for spare parts from months to days.

Distributed manufacturing

Semnet will provide these benefits to manufacturers in the Southeast:

- Use electronic bidding to get jobs.
- Tie together small independent manufacturers.
- Help deal with constantly changing partnerships.
- Use aggregate capacity for big jobs.
- Coordinate production schedules via network.
- Provide electronic just-in-time.
- Allow abbreviated factory setup time.

Qualified database

In a related effort, the consortium is establishing a networked database of manufacturing firm capabilities. The DOD or a commercial enterprise could use it to search for qualified bidders or to help gauge the qualifications of companies submitting bids.

The consortium has proposed to the DOD that it establish four centers for distributed computing — two in South Carolina connected by a dedicated fiber-optic line, one at the General Motors Research Laboratories in Warren, Mich., and one at the United Technologies Research Center in East Hartford, Conn. The two outside the state would be connected to Semnet via the Internet.

Three of the centers would initially conduct research on the use of parallel supercomputing in manufacturing environments, using computers from Kendall Square, Thinking Machines Corp. and others. One of the South Carolina centers would offer production capacity for Southeastern manufacturers.

Huray said he hopes General Motors and United Technologies will eventually also use the network to solicit bids for parts from other Semnet users.

Cable TV fills the bill

For companies that believe full-duplex videoconferencing is too expensive, SMTC may have an answer.

SMTC will use commercial cable television to carry real-time color video and data back and forth between users for on-line consulting and other applications. With the addition of a special board, an external converter box and software being written by SMTC, DEC and IBM, South Carolina manufacturing firms will be able to use their existing PCs and cable TV connections for desktop videoconferencing.

William Ranson, executive director of SMTC, estimated it will cost a company between $3,000 and $5,000 per PC to set up the capability. For a two-way conversation, two TV channels are needed, but he said that by phasing signals, a pair of channels will be able to support 100 simultaneous users.

The idea has been demonstrated experimentally, and it will soon be set up between sites in Columbia and Charleston, S.C., with the cooperation of two local cable TV companies that are connected by a land line.

SMTC plans to extend the reach of the technique to any region with cable TV and connections to the Internet. The Internet will convey data or video at 45M bit/sec. to one of three centers in South Carolina, where a computer node will feed traffic into the local cable TV network for access by local companies.

GARY H. ANTHES

NEW PRODUCTS

Local-area networking hardware

Asante Technologies, Inc. has announced a low-price 10Base-T Ethernet concentrator.

The 10T Hub/8 is an eight-port concentrator priced at $399. It includes autopartitioning for isolating network failures.

The company also lowered the price of its 10T Hub/12 from $999 to $799.

Asante Technologies
404 Tasman Drive
Sunnyvale, Calif. 94089
(408) 752-8388

Network management

Boole & Babbage, Inc. has released Net/Avail, an IBM Systems Network Architecture network monitoring and reporting system.

The software monitors network availability from an end-user standpoint, and it allows network managers to isolate chronic downtime problems.

Pricing starts at $12,000.

Boole & Babbage
510 Oakmead Pkwy.
Sunnyvale, Calif. 94086
(408) 735-9550

Wide-area networking hardware

Presticom, Inc. has introduced a data compressor capable of 256K bit/sec. throughput over a 56K/64K bit/sec. link.

The BCX-1000/256 supports a number of synchronous and asynchronous communications protocols. It includes a 56K/64K bit/sec. dial backup feature.

The compressor costs approximately $8,000.

The company has also announced the BCX-3000, a multiplexer/concentrator with the same compression capability as the BCX-1000/256. It includes Synchronous Data Link Control (SDLC) local polling for improved performance in IBM Systems Network Architecture/SDLC applications.

The BCX-3000 costs approximately $11,000.

Presticom
Suite 1
3275 1st St.
St-Hubert, Quebec J3Y 9Z7
(514) 443-2909

Gateways, bridges, routers

Compatible Systems Corp. has created the RISC Router 3000E, a two-port router based on a reduced instruction set computing (RISC) chip.

The Ethernet-to-Ethernet gateway/router is intended for local-area networks that include Apple Computer, Inc. Macintosh systems. Initial support is included for Appletalk, Transmission Control Protocol/Internet Protocol and Digital Equipment Corp. Decnet protocols.

The router costs $2,995.

Compatible Systems
Suite 102
4730 Walnut St.
Boulder, Colo. 80308
(303) 444-9532

Multiaccess Computing Corp. has announced a frame-relay Nubus adapter card.

The MCC-1000F includes a data service unit/channel service unit. It plugs into an Apple Computer, Inc. Macintosh II and provides multiple virtual connections over a frame-relay wide-area network at T1 and fractional T1 speeds.

The card costs $2,995.

Multiaccess Computing
Bldg. C, 5350 Hollister Ave.
Santa Barbara, Calif.
93111
(805) 964-2332

Customer-premises equipment

Digital Access, Inc. has announced the Virtual Bridge for dial-up video teleconferencing.

The product lets users employ videoconferencing at multiple locations without requiring stand-alone controllers at each post. Image quality does not degrade, regardless of the number of parties added to a conference, the company said.

Virtual Bridge costs $2,500 per installation.

Digital Access
Suite 200
11501 Sunset Hills Road
Reston, Va. 22090
(703) 471-5010

Comm Server 1.1 links PCs to microcomputers

The latest version of communications server from Digital Communications Associates, Inc. (DCA) and Microsoft Corp. began shipping last week. DCA/Microsoft Communications Server Version 1.1 works more closely with Microsoft network features.

The network-to-mainframe software now takes advantage of the remote access capabilities of Microsoft's LAN Manager Version 2.1. Comm Server will link portable and home computers to IBM mainframes as well as to other microcomputers on separate networks.

Comm Server sports a Microsoft Windows-based open client interface, which makes it simpler for third-party terminal emulation software to run on the server.

Shipping in configurations for eight, 32 and 64 simultaneous users, Comm Server costs from $2,995 to $8,995. Microsoft is based in Redmond, Wash. DCA is based in Alpharetta, Ga.

Here's what else you should know about global Enterprise Networking in four numbers: 1246

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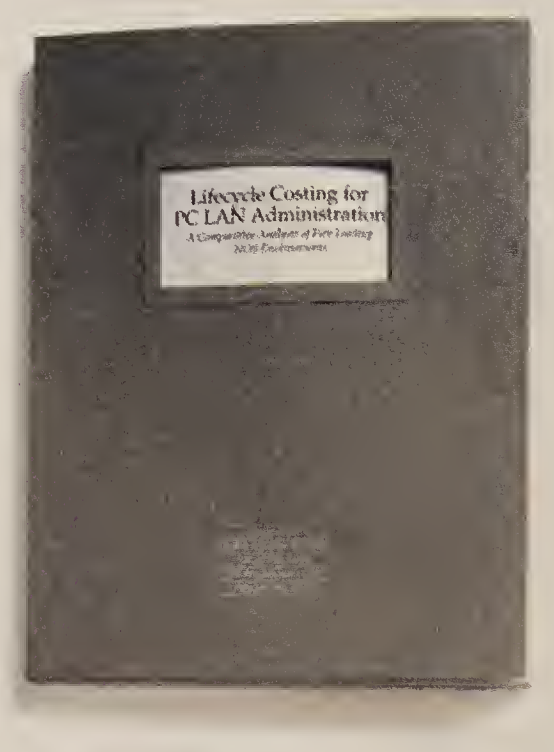

Send for this impartial survey of network cost-efficiency. It’s full of hard, actionable data.

Which brings us to the recently completed research report offered free on this page.

It was compiled by the Business Research Group, and shows how Banyan, Novell, IBM, DEC, and Microsoft stack up in cost of operation. We urge you to send for a copy of this report and to read it. It will help you make a better-informed decision.

What BRG did was to interview the day-to-day LAN managers at 180 different organizations about the length of time required to execute 11 typical network functions. All five network vendors were equally represented. But this is where the equality ended.

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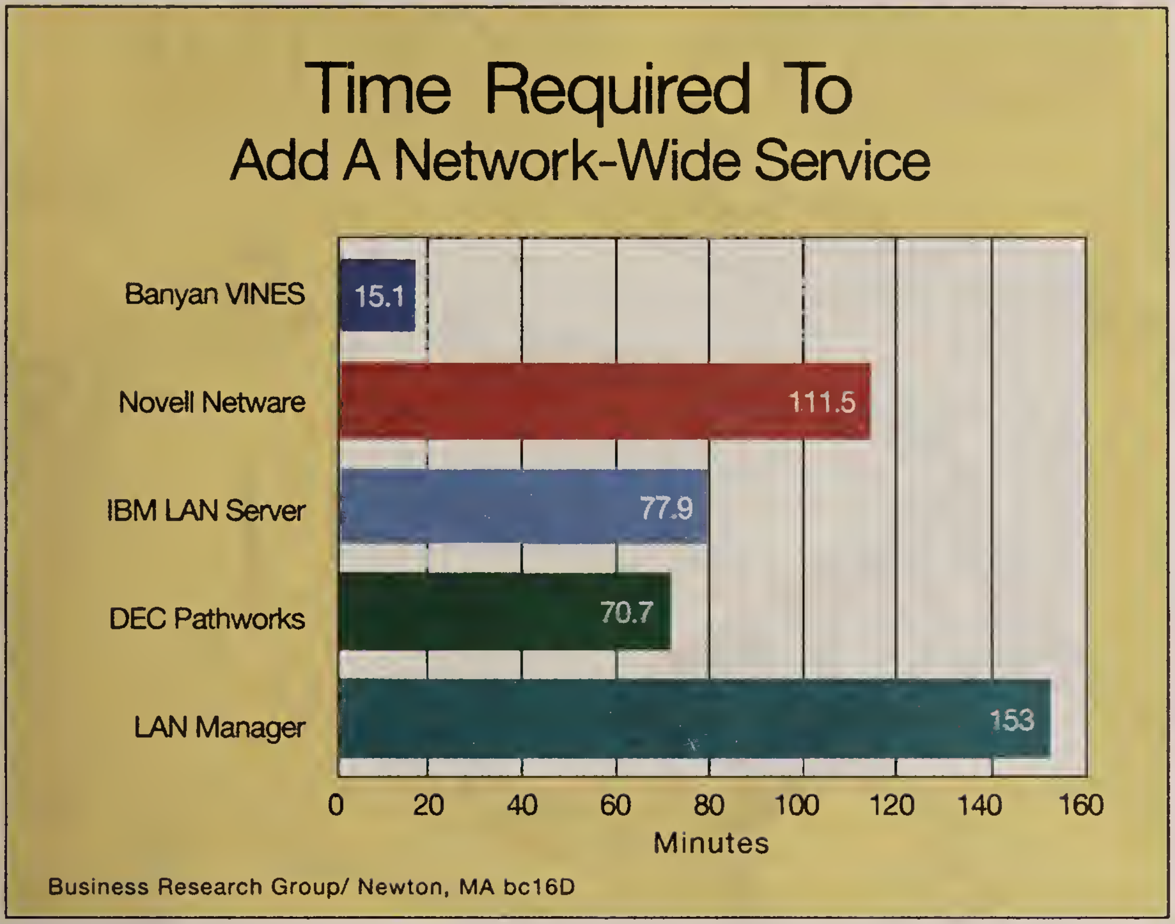

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gories. Often by margins that were astounding.

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As the chart above shows, you can add a network-wide service to a Banyan VINES network in a fraction of the time needed to perform the same task on other systems. It stands to reason, therefore, that VINES administrators are much more productive. That you'll need fewer of them as you grow. And that your network costs will always be held to the barest minimum.

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MANAGER'S JOURNAL

EXECUTIVE TRACK

Michael I. Brown has been promoted to executive vice president and chief information officer at **The New England**, a Boston insurance and investment company.

Brown had been senior vice president responsible for information systems since 1982. He continues to be in charge of all of the company's IS strategic development and planning, including voice and data, home-office and field facilities, printing and distribution.

Brown joined The New England in 1972 as a senior systems analyst in the computer systems development department. He was named director of that department in 1974 and has since assumed greater responsibilities. He was elected vice president in 1979.

Before joining the company, Brown worked for Electronic Data Systems Corp. He is a graduate of the U.S. Naval Academy.

……

Christopher J. Witham has been named to the newly created position of vice president of information technology at **Hercules, Inc.**, a chemicals manufacturer in Wilmington, Del. The appointment is effective Feb. 15.

Witham takes over the top IS position from **James R. Wray**, who retired at the end of 1991 after a 31-year career at Hercules. Wray had been director of information resources and operations support.

In his new position, Witham will report to R. Keith Elliott, Hercules' senior vice president and chief financial officer. Witham was CFO of Hercules subsidiary Aqualon Co. since last August. Before that, he had been controller and director of U.S. finance at Aqualon.

A native of the UK, Witham joined Hercules in 1976 as European audit manager based in Brussels. Before that, he worked in the investment banking, chemicals and accounting industries in the UK, France, Belgium, Switzerland and Spain.

Troubled automakers rethink IS

Big Three abandon inflated expectations, aim squeezed funds at EDI, dedicated nets

INDUSTRY CLOSEUP

IS in the Automotive Industry

BY ALICE LAPLANTE
SPECIAL TO CW

The U.S. auto industry is experiencing its worst year ever. The aggregate losses for the Big Three automobile manufacturers in 1991 have been estimated at $6 billion. That is equal to Iceland's gross national product.

With no immediate end in sight to the economic doldrums and with the ever-present competition from foreign carmakers, Ford Motor Co., General Motors Co. and Chrysler Corp. have been rethinking many of their strategies, including their use of information systems.

"There has been an industrywide disappointment with technology," says Norman Lewis, director of corporate systems planning and development at Ford. "Expectations were wildly exaggerated, with manufacturers automating excessively without understanding what was wrong with the underlying processes," Lewis says.

That disappointment and cold economic reality have led to a squeeze in IS budgets. A recent CSC Index, Inc. survey found that systems budgets for U.S. automobile and parts manufacturers will increase only 1.4% next year, a steep decline from last year's increase of 6.5%.

With less discretionary money to spend, automotive IS chiefs have been called on to spend it wisely and conservatively without sacrificing competitiveness. To that end, they have been targeting ways to improve or revamp their lines of communications to their suppliers through electronic data interchange (EDI), just-in-time setups and dedicated networks.

Optimizing the producer/supplier link is attractive to automakers that see this as a means to reduce excess inventory, cut delivery time, improve efficiency of production scheduling and assist design and quality control efforts.

The upshot, the carmakers hope, will be cheaper and faster production of a better product.

Leaner and meaner

At GM, which recently announced that it will be closing 21 plants and eliminating 74,000 jobs over the next four years, the biggest IS project in the works is one aimed at streamlining its complex and redundant links among suppliers, manufacturing sites and dealers to get it closer to just-in-time manufacturing efficiency.

GM's Integrated Scheduling Project (ISP), which is slated for completion by the end of 1993, will eventually replace 30 different materials and scheduling systems with one integrated system to handle inventory, manufacturing and financial data. The first stage of this effort was completed in December at GM's Lansing Car Assembly Plant in Michigan, where GM has replaced over a dozen site-specific systems with the ISP system.

Using the new ISP system, a five-module application system developed by Electronic Data Systems Corp. (EDS) personnel, Lansing management can receive orders from the various car divisions for the number and type of vehicles to build, and then create an estimated 20-week manufacturing schedule for itself and its suppliers.

In addition to that long-term schedule, suppliers are sent schedules via EDI each morning before the plant opens. "It tells them what materials need to be delivered to what docks at what hour during that manufacturing day," says Richard Price, the EDS account manager at the Lansing plant.

At Chrysler, infor-

To page 68

Fritz Dumville

ATM pioneers reaped market share, income

BY MITCH BETTS
CW STAFF

At a time when the business value of information technology investments is under fire, there is some good news. Researchers have produced hard evidence that one of the earliest strategic information systems — the deployment of automated teller machines (ATM) in the 1970s — really did produce big and lasting rewards for the pioneers.

That is the conclusion of assistant professors Brian L. Dos Santos at Purdue University and Ken Peffers at Rutgers University, who studied 3,000 banks using data from the Federal Deposit Insurance Corp. and the Federal Reserve.

The goal of the study was to determine whether early adopters of ATMs in the 1970s were able to increase market share, increase profits and reduce costs. The answers turned out to be yes, yes and no.

Market share increased

Midsize and large banks that were early adopters of ATMs obtained whopping increases in market share, Dos Santos said. For example, banks with assets of $500 million that adopted ATMs in 1973 saw their market share increase an average of 38% by 1983, a direct result of their ATM networks.

Apparently, customers changed banks to take advantage of the convenient ATM services, he said. The market gains by early adopters were not lost by 1986 (the end of the study period), even though by 1986, most banks had offered ATMs.

The study found that ATM pioneers had bigger profits, too. For example, banks with assets of $500 million that adopted ATMs in 1973 had an average profit increase of $7 million each year for a 10-year period because of their ATM networks, Dos Santos said.

The biggest rewards went to "first-mover" banks that deployed ATMs in the early 1970s, whereas the followers in the late 1970s gained very little, he noted. Very small banks (with assets of less than $50 million) did not boost market share or profits from early ATM adoption, the study found.

The dark cloud around this silver lining, however, was on the cost reduction issue. The researchers found no support for the assumption that ATMs have reduced costs in the banking industry.

Troubled automakers rethink IS spending

CONTINUED FROM PAGE 67

mation technology is currently focusing on strengthening the already-strong commitment to standard EDI communication among the various plants and suppliers by putting enormous emphasis on the quality of information conveyed electronically.

Currently, 98% of production suppliers are using EDI, according to Chuck Beerman, advanced systems executive for production control at Chrysler. This has helped the Detroit-based manufacturer operate more effectively with a third of the manpower it had five years ago, he says.

A recently implemented system developed in-house and based on expert system concepts verifies the accuracy of advanced shipping notices (ASN) electronically transmitted by suppliers. The program checks to make sure that all relevant information — such as what is being shipped, the quantity being shipped and where it is being shipped — is not only present but correct.

"If the supplier puts a supply number or a plant shipping code that doesn't exist, the system catches it right away and immediately sends the supplier a message that asks for a correction," Beerman says.

Furthermore, the ASN transaction is automatically matched to pricing and inventory databases at the automaker, enabling it to track inventory levels and payment schedules.

Chrysler is also working on conveying more data on standard EDI transmissions. For example, if there is a quality problem with a shipment, Chrysler now uses EDI to notify the supplier within an hour (as opposed to weeks) of the problem.

Ford is attempting to make EDI a vehicle for information sharing that is a major step beyond information exchange, Lewis says. "Sharing means the supplier has just as much ownership of the system and the information as you do," he explains.

In some instances, making suppliers co-owners of information also means giving them much more decision-making authority. For example, Ford is now pilot-testing a system that allows suppliers to look into its inventory databases in real time using Ford-supplied terminals. The goal is to give suppliers the ability and authority to determine what to ship to meet Ford's manufacturing schedule.

FORD IS NOW pilot-testing a system that allows suppliers to look into its inventory databases in real time using Ford-supplied terminals.

For U.S. automakers, the next great frontier in IS-facilitated cooperation with suppliers is the product design cycle.

While there are philosophical reasons for a lack of design synergy in the U.S. (see story below), the technical obstacles boil down to a dearth of standards: There are multiple proprietary graphics and computer-aided design and manufacturing (CAD/CAM) systems used within each manufacturer's operations, making it difficult for a supplier to operate efficiently with a myriad of plants and automakers.

In fact, according to statistics from the University of Michigan's Department of Transportation, in pre-CAD/CAM days, the 1955 Chevrolet had a product introduction cycle of approximately two years. The current average cycle for domestic manufacturers using CAD/CAM has more than doubled to 4½ years.

A joint venture involving the Big Three, announced in November, will attempt to remedy the situation by developing CAD/CAM standards for the entire industry, says Henry Osti, a consultant at CSC Index in Boston.

Furthermore, CAM-I, a manufacturing consortium funded by 100 industry members in Arlington, Texas, announced in December a new program called Quality Customers Quality Suppliers. This program will focus exclusively on relationships among manufacturers and suppliers and how they can be improved through technology as well as better managerial and organizational practices.

For its part, the federal government has attempted to standardize electronic transmission of engineering and parts specifications with its Computer-aided Acquisition and Logistics Support (CALS) initiative. However, says Michael W. Roberts, CAM-I's international program director, CALS has not caught on widely within the automotive industry. The reason? Because so few U.S. manufacturers involve their suppliers in the design process, it makes little sense for suppliers to invest in expensive, proprietary technology that automates that process.

"We haven't yet been told we would be cut out of business if we didn't comply, which was the case with EDI," says Jim Bonham, electronic communications manager at The Gates Rubber Co. in Denver, the world's largest supplier of automotive belts and hoses. "The new joint venture on CAD/CAM should help enormously."

LaPlante is a free-lance writer in Palo Alto, Calif.

Dealer talk

There is another side to the communications equation: manufacturers' links with dealers. Bob Denner, a partner at Andersen Consulting, lists where dealers and manufacturers link up now or will in the future:

- **Ordering vehicles.** Dealers are currently on-line for finding cars within a region for clients.
- **Ordering replacement or repair parts.** Dealers can now do this through EDI.
- **Approving customer credit.** Dealers can currently hook up electronically to a manufacturer's credit bureau computer and get credit approval in minutes.
- **Speeding distribution.** Technology will eventually shrink factory-to-dealer time from six weeks to two.
- **Preparing custom orders.** Eventually, just-in-time and EDI links will enable clients to get the exact car they want within a week. This would cut down on the costs of cars because car makers would not produce stock that doesn't sell.

Family dynamics, Japanese-style

How Japanese automakers relate to their suppliers is less of a technical issue than a philosophical one. Unlike the U.S. automakers, Japanese carmakers look upon their suppliers as part of the "family," not as adversaries out of whom to squeeze the most favorable terms. They use technology to strengthen bonds, involving suppliers in all aspects of the design and manufacturing process. U.S. carmakers should take heed.

According to research consortium CAM-I, automakers in Japan depend on suppliers to provide more than 50% of the engineering design work when developing new car models. To this end, they even shoulder part of the cost of EDI. In the U.S., carmakers ask suppliers to contribute less than 20% of the design work — and take 25% longer than the Japanese to introduce new products.

Not only do the Japanese get their cars to market faster, but their relationship with suppliers also helps their product quality efforts. "The Japanese ask, 'Who knows best how to design a fuel injector system — the supplier who will actually build the part or the carmaker who will merely assemble it into a finished product?' " says Michael Roberts, international program director of CAM-I.

The answer, at least to the Japanese, is obvious. "The result," Roberts explains, "is fewer quality problems, because the people who know the operating principles of building a good fuel injection system are helping to design it."

Beyond a change of mind-set, U.S. automakers need to implement the technologies that make the synergy happen, such as standardized design databases that facilitate direct electronic transfer and data manipulation; computer simulation capabilities shared among manufacturers and suppliers; and real-time networked systems that enable remote electronic design "brainstorming" to avoid duplication of effort, says Henry Osti, a consultant at CSC Index.

The U.S. manufacturers may want to look to their Japanese counterparts for examples of how the technology synergy is put to work. For instance, Mitsubishi Corp.-owned Diamond Star Motors Corp. in Normal, Ill., is implementing sequential processing — the "ultimate EDI," says Rex Schemerhorn, IS manager.

"When we are building a car, we actually broadcast the data for that sequence number to our supplier just as if that supplier were part of our assembly line," Schemerhorn explains. "We have a team or family relationship with our suppliers that goes way beyond EDI and is critical to the way we do business," he says.

CALENDAR

FEB. 2-8

infocomm International. Washington, D.C. Feb. 3-9 — Contact: The International Communications Industries Association Annual Convention (ICIA), Fairfax, Va. (703) 273-7200.

Speech Tech/Voice Systems Worldwide '92. New York, Feb. 4-6 — Contact: Media Dimensions, New York, N.Y. (212) 533-7481.

Western Communications Forum. Anaheim, Calif., Feb. 3-5 — Contact: Western Communications Forum, Chicago, Ill. (312) 938-3500.

information Management Conference. New York, Feb. 4-5 — Contact: The Conference Board, New York, N.Y. (212) 759-0900.

FEB. 9-15

Structured Testing. Bellevue, Wash. Feb. 11-13 — Contact: Diane Cole, Computer Power Group, Phoenix, Ariz. (602) 956-7575.

The New Rules of the IRS Seminar. Arlington, Va., Feb. 12 — Contact: Electronic Data Interchange Association, Alexandria, Va. (703) 838-8042.

Government Technologies Conference/Southwest Region. Austin, Texas, Feb. 12-14 — Contact: GMW Communications, Sacramento, Calif. (916) 443-7133.

Nolan, Norton & Co. Annual Symposium. Tarpon Springs, Fla., Feb. 13-14 — Contact: Joan Elder, Nolan, Norton & Co., Lexington, Mass. (617) 862-8820.

Computer Graphics '92. Orlando, Fla., Feb. 10-12 — Contact: Sheila A. McDonald, Frost & Sullivan, Inc., New York, N.Y. (212) 233-1080.

Networld '92. Boston, Feb. 11-13 — Contact: Annie Z. Scully, Bruno Blenheim Associates, Englewood Cliffs, N.J. (201) 346-1400.

Dexpo. Calgary, Alberta, Feb. 11-13 — Contact: Miller Freeman Expositions, Boston, Mass. (617) 232-3976.

FEB. 16-22

information Security Managers Symposium. San Diego, Feb. 18-20 — Contact: Pamela Bissett, MIS Training Institute, Framingham, Mass. (508) 879-7999.

CASE World Conference & Exposition. Santa Clara, Calif., Feb. 18-20 — Contact: Digital Consulting, Andover, Mass. (508) 470-3880.

FEB. 23-29

Annual Platforms For Computing (PC) Forum. Tucson, Ariz., Feb. 23-26 — Contact: Edventure Holdings, Inc., New York, N.Y. (212) 758-3434.

MARCH 1-7

10th Annual Computer-based Training Conference & Exposition. Orlando, Fla., March 2-5 — Contact: The Conference Department, Weingarten Publications, Inc., Boston, Mass. (617) 542-0146.

MARCH 8-14

The CIO Perspectives Series — The Business of IT: Finding the Payoff. San Diego, March 8-11 — Contact: CIO magazine, Framingham, Mass. (508) 935-4631.

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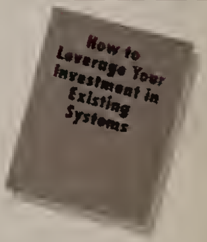

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CPW

EXECUTIVE REPORT

CUSTOMER SERVICE

IS at your service

Increasingly, the corporate quest for happy customers is enlisting technology's aid

Michael Norton

US West's Stephen Archuleta *hopes distributed mainframe access will reduce time customers typically spend on hold while reps hunt down information (see story page 76)*

BY DEREK SLATER

Yes, sir! Lickety-split, right away, in your size first thing in the morning, no charge, and thank you for calling! Customer service is hot these days, and information technology is fast emerging as the biggest servant of all.

As markets grow tighter and product life cycles shorten, many U.S. businesses are increasingly counting on superior service to help them stand out. And information systems, with its potential for gathering and analyzing data on customer needs and attitudes, is playing a growing role, especially in the hard-hit financial services and automotive industries.

"Everybody is pretty competitive on price," explains Gary Orrell, staff vice president of MIS at The Hertz Corp. "Service is the No. 1 factor for differentiation." Over the past few years, the Park Ridge, N.J.-based auto rental agency has installed a variety of technology-based customer service programs.

Indeed, recent polls suggest widespread interest and increasing spending on customer-oriented applications in the coming year.

- A new survey of 444 senior IS executives by CSC Index, Inc. found that four of the top six areas for technology investment for 1992 are related to customer service. Order processing ranked first, with nearly half (48%) of surveyed companies planning to invest, followed by postsale customer service (46%), product delivery (43%) and presale customer service (35%). Executives in nine of 16 vertical markets polled listed service technologies as their top investment area.
- "Customer service" was most frequently cited by 1991 *Computerworld Premier 100* winners as "the biggest challenge" facing their industries in 1992.
- The American Bankers Association released a survey last August showing that many members are planning to implement or expand customer-oriented technologies, notably financial electronic data interchange (EDI), platform automation, voice-response systems and automated teller machines, in 1992.
- A study by Ledgeway/Dataquest reported that service delivery systems make up about 40% of technology spending by service vendors.
- The National Association of Realtors is expanding a major project aimed at promoting personal computer use among its 800,000 U.S. members. A main goal is to improve customer service, association officials say.

Companies taking the plunge will join U.S. Healthcare, Inc., Prudential Securities, Inc., The Chase Manhattan Bank NA, BMW of North America, Inc., Portland General Electric Co. and hundreds of other firms that have recently installed or upgraded customer-oriented systems. Interest is not confined to the U.S. The division president of The Molson Cos. last summer told a Canadian conference on the use of information technology that the "customer is going to be king" in the new business era and predicted that IS will be a key factor in providing top-notch service.

Big impact still possible

Why all the interest? One big reason, analysts say, is that customer service today goes well beyond smiles and refunds for disgruntled buyers. "It used to just mean, 'Did you get me the right product at

Continued on page 72

Slater is *Computerworld*'s new products writer.

MAY WE HELP YOU?

Customer Service

KEY POINTS

- ▶Many U.S. businesses are exploring new ways of deploying information technology to improve customer service.
- ▶Common obstacles include difficulty in assigning a dollar value to paybacks and poorly planned systems that ignore customer needs.
- ▶Domino's Pizza hopes to get better, quicker customer feedback by modernizing and automating a 15-year-old survey system. See story page 73.
- ▶After a decade of operation, the GE Answer Center continues to evolve. See story page 72.
- ▶US West Communications is undertaking a $25 million overhaul to reduce on-hold time for its small-business customers. See story page 76.
- ▶Most popular technologies include EDI, electronic imaging, inventory management, digital radio networks, automated call distributors, expert systems and handheld computers. See story page 80.

QUOTABLE:

"Service is the No. 1 factor for differentiation."

Gary Orrell
The Hertz Corp.

GE answers call to evolve 10-year-old help line

BY ALAN RADDING

"There's water on the floor around my washing machine," an anxious caller tells the General Electric Co. Answer Center representative. Within seconds, the representative is running through a computerized checklist of likely causes: a loose hose, a blocked drain or perhaps a problem inside the machine.

In most cases, the problem can be identified in minutes and even corrected by the caller. If the fix requires a trained service technician, the caller is switched directly to the GE Service Center, where he can schedule an appointment if he desires.

By offering one-call customer service, the GE Answer Center in Louisville, Ky. — part of the $6 billion, 25,000-worker GE Appliance Division — eliminates the frustrating customer service runaround, says William Waers, manager of consumer communications and telemarketing.

According to Waers, most calls to the service center are resolved with a single call. That's a big improvement from the manual systems of bygone days that required service representatives to thumb through thick manuals to diagnose problems.

Immediate access

Behind the effectiveness of the GE Answer Center is a massive text database containing more than 1 million problem-resolution responses. Any of these can be called up in less than two seconds — and often less, says Annette Mattingly, information technology team leader.

The system also contains continually updated files of product, dealer, service, parts and merchandising information. An indexing algorithm is used to call up data using key-word searches.

GE opened the Answer Center 10 years ago. Since then, four full-time programmers have been updating the problem-resolution text database daily. It's a good example of a service pioneer that has kept evolving.

Today, the center employs 225 people. It handled 3.5 million customer service calls in 1991, up 500,000 from 1990.

GE's Answer Center *in Louisville, Ky., reduces customer frustration by offering one-call service*

Customer service representatives working at terminals connected to a Bull HN Information Systems, Inc. DPS-9000 mainframe each handle more than 100 calls a day.

Service representatives handle a range of appliance brands, including GE, Hotpoint, RCA Corp. and Monogram. They are backed by a team of 12 product support specialists who develop responses for situations not already in the database. If needed, these specialists also provide more detailed information directly to callers, typically do-it-yourselfers trying to fix products themselves.

According to Waers, "customer service . . . puts a human face on the corporation and builds customer loyalty." But he says pinpointing exactly what constitutes customer satisfaction is a bit tricky.

Key considerations include meeting buyer expectations, such as pointing customers to the nearest free warranty service, providing tips on how to best use a product or saving the caller the price of a service visit by guiding him through the repair process.

The Answer Center system gives callers four kinds of detailed information: prepurchase, use and care, service assistance and other assistance.

Taking the pulse of customers

Besides giving callers information, the system also helps GE take the pulse of customers. For example, if a particular issue suddenly crops up, the system prompts customer service representatives to poll callers with questions related to the issue.

The system randomly prompts representatives to request a customer's name and phone number. That information can be turned over to independent research firms to conduct customer satisfaction surveys. Surveying is performed daily and is reported every six months.

Representatives use the system to support new sales. For instance, workers help callers decide whether to fix or replace an appliance by providing new product pricing, service call fees and other information. Similarly, representatives prompted by the system can steer callers to dealers participating in special merchandising promotions. This, in turn, stimulates greater dealer participation, Waers says.

However, GE says it does not use the system to identify and track individual callers because most customers prefer anonymity. "We don't take the caller's name unless we have their permission, and we don't use any automatic number identification," Waers says.

Finally, computerization also helps eliminate "telephone tag," which frustrates customer and company alike.

GE considers the system a success: On its most recent customer satisfaction report card, GE hit an all-time high of 96% satisfied, Waers reports. Even so, evolution continues.

The Answer Center is slowly migrating from its old Bull to an Amdahl Corp. mainframe environment, Mattingly says. The Bull system continues to handle the bulk of the applications, which run under GE's Common Software Environment. The system is two-thirds completed; administration and training modules are already in use.

A quality-control application was put on hold when the division was restructured.

"We are now using a team approach with high employee involvement. [The monitoring application] was a system for when we had a lot of supervisory people," Waers explains.

Under consideration for future use are workstations, artificial intelligence, imaging and graphical user interfaces. Major changes will be approached with caution, however. With 3.5 million callers a year, "we have to plan our changes so there is no negative effect on customer service," Mattingly says.

While technology anchors the system, Mattingly says, excellent service also requires college-educated workers, a low turnover rate and good training. •

CLOSE-UP

Company: General Electric Appliance Division.

Goal: Increase satisfaction, response speed and usefulness of 10-year-old GE Answer Center.

Strategy: Migrate from Bull DPS-9000 mainframe to Amdahl IBM-compatible environment; add to 1 million entries in problem-resolution database.

Payoff: Faster response and quicker routing for 3.5 million customer calls received each year.

Radding is a free-lance writer in Newton, Mass.

Customer service turns IS into biggest servant of all

CONTINUED FROM PAGE 71

the right time and place?' " says John Cunningham, president of Competitive Technologies, Inc., an Easton, Conn., consultancy.

Now, Cunningham says, it means pleasing buyers in many areas.

Customers, for example, may want to choose from a wide variety of products and options. Some might like to order electronically, pay by charge card or corporate account and have goods delivered immediately.

Besides demanding quick and accurate technical support, buyers may also have special requests, such as a Spanish-speaking sales representative or 24-hour ordering.

"Information technology is being invested in because it's really the only way to enable customers to look at the information they want, whenever they want to and for whatever purpose they want," says Daniel Pfau, vice president of Cambridge, Mass.-based CSC Index. "Information technology makes that process seamless and fast."

Imaging, EDI, voice response and others are seen as hot technologies for speeding and streamlining the flow of information from the business to the customer and back (see story page 80).

Chance to gain edge

However, an even bigger reason, according to IS managers and consultants, is that customer service is among the small — and shrinking — number of areas in which technology can be used to gain competitive advantage.

By some estimates, gaining a new customer can cost as much as five times more than retaining an existing one. So a freight company that can quickly pinpoint the location of a missing package, for instance, will find its efforts well worth it.

Typical of the desire to quickly and accurately handle customer calls is Copperstate Business Systems, a Phoenix-based firm that retails and services point-of-sale systems.

"We needed to become more efficient because as our products have become more reliable, we receive fewer calls for service," says Tom Francis, system administrator at Copperstate. "Our service department also needs to dispatch our field technicians and track service calls properly."

To that end, the firm recently installed integrated service management and sales software that it says tracks incoming calls better and provides lower prices and better reputation.

Another factor driving interest in customer service technology, Cunningham notes, is that product life cycles are decreasing in nearly every market. For IS, that means building systems that can quickly identify and supply whatever information the customer wants.

Whirlpool Corp. did just that. The appliance maker's service centers in Knoxville, Tenn., and Benton Harbor, Mich., integrate imaging, artificial intelligence and other technology to provide speedy customer response.

Customer calls to the center are routed to a service agent, along with a database file listing all previous service calls. Company officials say having caller information in hand helps Whirlpool employees anticipate customer needs and results in shorter calls, thanks to on-line manuals.

Another example is this: Simon & Schuster, Inc. plans to install a voice-response unit that will provide automated Touch-Tone order entry around the clock. Connected to inventory records, the voice-response unit will also handle routine price and availability inquiries, freeing human operators to deal with more complicated customer calls such as complex multiple-title orders.

"Use of technology is becoming more widespread in the publishing industry," says Rick Bates, vice president of custom-

Domino's: How was your pizza, ma'am?

BY MEL MANDELL

Any way you slice it, the pizza business is very competitive. That's why Domino's Pizza — long dominant in home delivery but not generally considered a leader in customer satisfaction — is counting on better service to spice up its efforts in the ongoing pizza wars.

By year's end, the Ann Arbor, Mich.-based firm will have finished installing a revamped, paperless version of its 15-year-old "Mystery Customer Survey" system. Based on networked personal computers and servers linked to an IBM Enterprise System/9000 mainframe, the new system will speed up handling of customer complaints, according to Robert Greig, Domino's manager of marketing and operations systems.

Instead of the paper questionnaires now used in most of the chain's 5,200 outlets, complaints will be keyed into PCs and handled electronically, Greig says. At present, customer gripes are collected via mail-in questionnaires, which are then scanned into databases.

Pie wars rage on

The Mystery Customer Survey system represents an important weapon in Domino's battles against the hungry pack of competitors taking huge bites out of the lucrative pizza home delivery business.

In just six years, Domino's has watched its 60% share of the home delivery market melt to 50%, according to Gerry Durnell, editor/publisher of *Pizza Today*, a trade magazine. Pizza Hut, Inc., the world leader with more than 7,000 pizzerias, pushed into home deliveries in 1985 and now has a 24% share, he says.

Durnell also says customer surveys conducted by his magazine show Pizza Hut's product continually rates better than Domino's. Overall, according to Roy Burry, an analyst at Kidder, Peabody & Co., Pizza Hut is simply "much better managed" than Domino's.

What's more, Little Caesar Enterprises, the third-largest pizza-parlor chain, is now starting home deliveries. Add the tens of thousands of independent "mom-and-pop" pizzerias that also deliver, and you've got a crowded table.

So Domino's, whose earnings totaled $5.4 million last year, is counting on technology to help improve its image and market share.

In mid-1989, Peggy Bestervelt, director of the survey at Domino's headquarters, decided it was time to consider upgrading the survey. Her vision was to eliminate paper forms and instead have pollers call customers at random via toll-free lines, then enter results using programmed workstations. (Customers are asked for their phone numbers when they place an order.)

A big hoped-for advantage was more accurate data. Paper questionnaires using checkmarks are rated "very inadequate" by Ronald Bass, a vice president at Louis Harris & Associates, Inc., the New York-based professional pollsters.

Many of the 10,000 Domino's customers surveyed each month didn't return their questionnaires, despite a $5 credit on future orders. Plus, many forms were returned incomplete, forcing the chain to employ 35 clerks to call customers for missing answers. This caused processing delays, which in turn allowed poorly performing stores to go undetected for weeks.

Using Foxbase from Fox Software, Inc. in Perrysburg, Ohio, Commonwealth Data Corp. in nearby Plymouth, Mich., created initial online query screens for about $30,000. Now in pilot phase, the project is using a 286-based PC to query customers in a 150-store region in Florida.

Domino's switched contractors when the lead programmer went to work at BDO Seidman in Troy, Mich. Andrew Caldwell, systems programmer at BDO, says he is now trying to make the program friendlier to users with fewer keystrokes.

Eventually, Greig says, pollers working in two shifts on 25 PCs connected by a Novell, Inc. network will be able to poll 12,000 customers a month. The network will be hardwired to the company's IBM ES/9000 mainframe, which will maintain the extensive database and will probably use a high-end Compaq Computer Corp. PC as a server.

Automatic letters

The surveys use a 1-to-10 scale to assess speed of delivery, pizza appearance, doneness, crust thickness, temperature, taste and attitude of order takers and delivery people. There is also room for other positive and negative comments.

Paper reports are printed on IBM laser printers connected to the mainframe. Reports to regional managers are sent over phone lines to local printers driven by IBM System/36s in the company's nine regional offices.

One of the pilot system's features is automatic determination of delivery time. Besides saving time, the feature eliminates manual calculation errors and automatically generates a thank-you form letter and rebate check. Store managers can also sort information by date.

Domino's cooks up *electronic customer survey to solicit feedback*

Bestervelt says nationwide implementation should be completed by the end of the year. While the overall cost is not clear at this point, she says she is certain that it will be lower than present costs.

Although Domino's has 466 outlets in 25 countries, there are no plans to expand the program internationally. Nevertheless, Bestervelt says she expects some overseas franchisers to set up their own versions of the Mystery Customer Survey in time. •

Mandell is a New York-based writer who covers technical subjects.

CLOSE-UP

Company: Domino's Pizza.

Goal: Obtain more accurate customer feedback to increase satisfaction.

Strategy: Create pilot for new electronic customer survey system based on PCs and servers networked to IBM ES/9000.

Payoff (anticipated): Faster response to customer complaints and better tracking of management at 5,200 outlets in the U.S.

---

er operations at the Old Tappan, N.J.-based publisher. "You almost have to have a smorgasbord of technologies because different people will prefer different ways of ordering."

Portland, Ore.-based shipper Consolidated Freightways, Inc. invested $10 million for an imaging system to cut customer document request processing from days to minutes. In May 1991, the company cut the ribbon for a central imaging facility with an eight-processor Tandem Computers, Inc. VLX system with 14 optical disc jukeboxes.

According to Martin Lulay, general manager of the imaging unit, the system cut "by at least half" the 500,000 man-hours per year Consolidated Freightways used to spend shuffling and storing paper shipping records. This allowed employees to be shifted to other duties, he says, and freed up 50% to 80% of office space previously occupied by filing cabinets.

Besides anticipated dollar savings from the project, Lulay says, the shipper will also try to boost the bottom line by giving other companies in the industry access to the image service.

But before you rush out to pitch a new customer service system, be prepared to tackle a couple of big problems IS managers and consultants say are common.

Beware of obstacles

For starters, assigning a dollar value to the payback of customer service systems is often a major obstacle. "Is [the system] just going to supply intangibles, or is it going to provide a real return on investment?" asks Elizabeth Soder, vice president at Chicago-based Technology Solutions Co., a consulting and systems design firm. "It tends to be hard to quantify."

MAY WE HELP YOU?

To sidestep the problem, some firms define service level goals rather than looking exclusively at the bottom line. At Burlington Northern Railroad Co. in St. Paul, Minn., "We've established pretty specific [information technology] service objectives for things like reliability and response times to customer requests," says Robert Brydges, assistant vice president of IS.

Customers calling with a problem are told to expect a call back within 15 minutes, and systems used for customer service are expected to have 99.5% availability. The company is evaluating several new service technologies to continue to smoothly connect to customers who use their shipping services.

"By providing a clear definition of the benefits and putting in place a program to make it happen, you keep the attention of top management," Soder says.

Consultants and IS managers also warn of another big danger: poorly planned systems that ignore customer needs. It's sad, Cunningham says, but many businesses expend a lot of "wattless energy" on projects that don't really matter, such as spending big money on an electronic-mail system in cases where customers prefer to do business by phone.

To avoid building an expensive white elephant, Simon & Schuster uses surveys as well as one-on-one feedback from customers at trade shows to keep track of clients' changing needs, Bates says. For example, customers at an industry show were polled about their willingness to use voice-response equipment. The plan proceeded only when an overwhelming 90% of the respondents said yes.

Further growth seen

Consultants say future direction of IS service projects will depend heavily on new technologies. For now, IS directors and analysts agree that much more can still be accomplished with available products.

More executives are agreeing with Warren Blanding, chairman and chief executive officer of The Customer Service Institute in Silver Spring, Md. He says technologies such as Touch-Tone phone, bank cards and automatic number identification have already changed how service is provided and will certainly do more of that than ever in the future. •

Free-lance writer Paula Jacobs contributed to this article.

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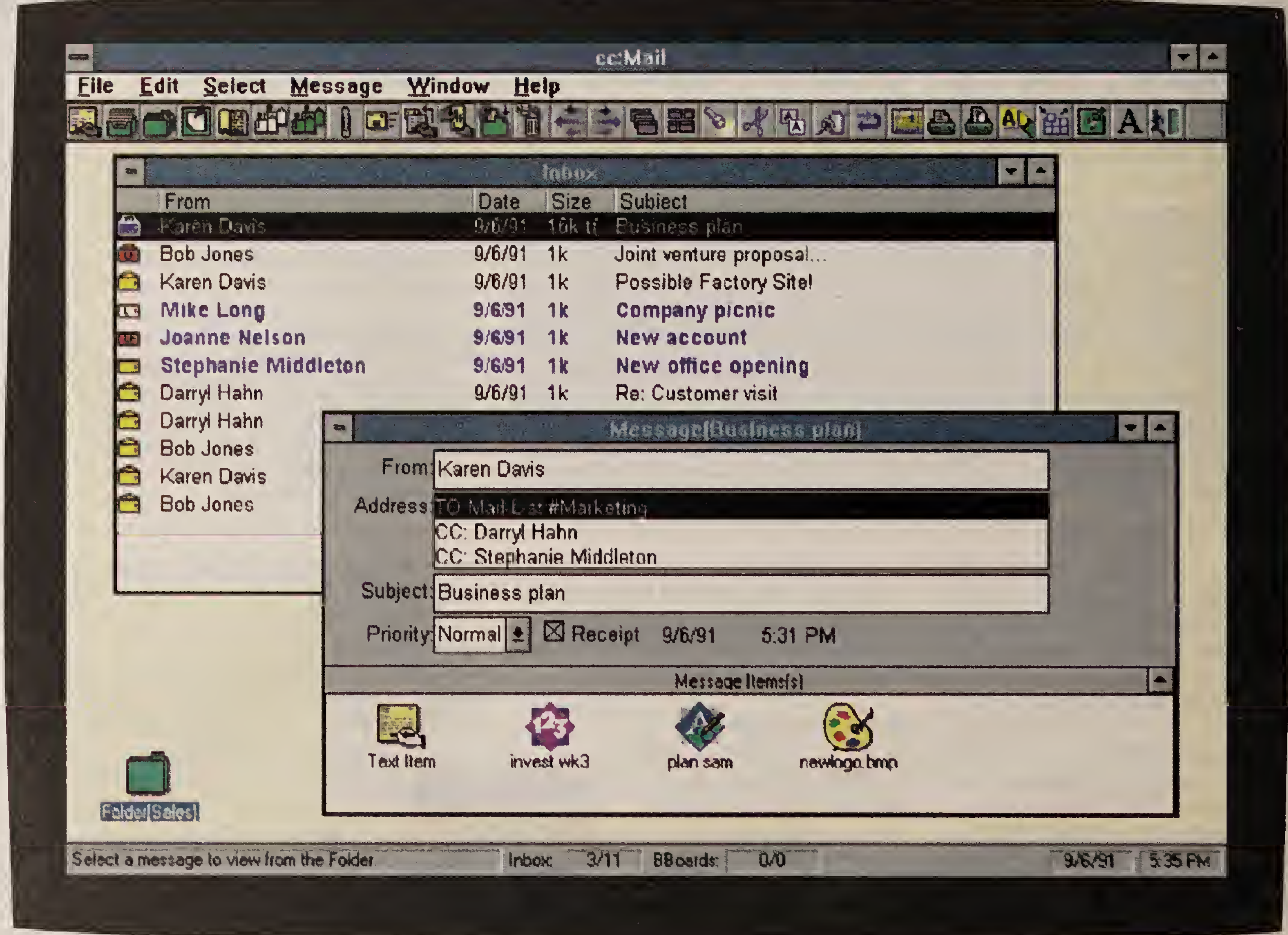

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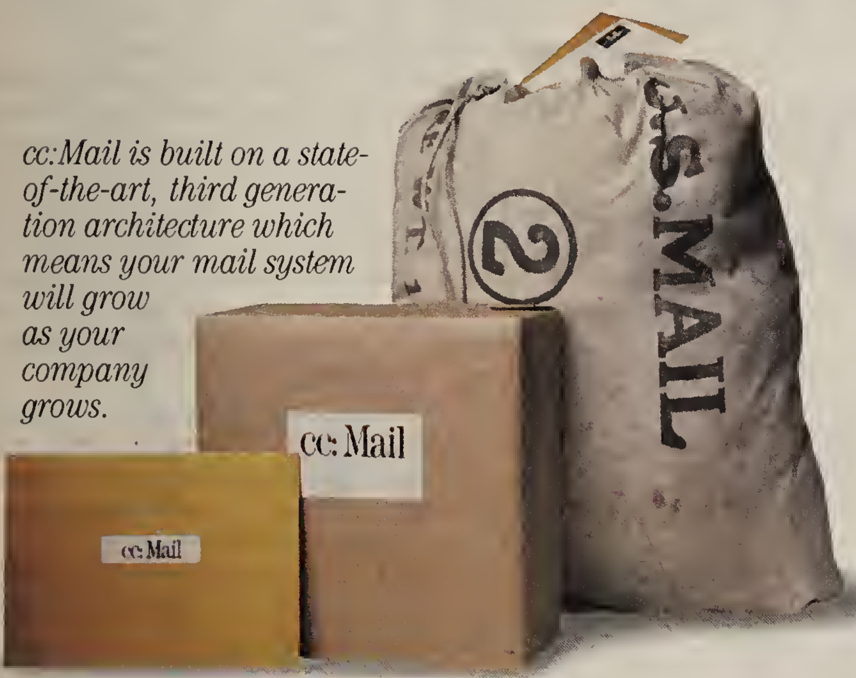

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LAN TIMES
READERS CHOICE
1990
1991

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US West dials systems help to keep customer calls coming

BY DEREK SLATER

US West Communications, Inc. knows on-hold callers forced to sit twiddling their thumbs are likely to let their fingers do the walking to another phone company.

So the largest subsidiary of US West is undertaking a $25 million major systems overhaul for its Small Business Services (SBS) unit in hopes of providing speedier responses to customers calling in to request information.

Six scattered mainframes are being equipped with Unix servers from Digital Equipment Corp. and 19-in. color X Window System terminals from Tektronix, Inc., according to Stephen Archuleta, director of systems for the SBS unit.

The goal is to provide distributed mainframe access, which reduces the time customer-assistance representatives must spend locating phone use data requested by small-business callers, Archuleta explains.

Based in Denver, $28 billion US West provides regional long-distance and local phone service and communications systems to about 26 million customers in 14 Western states. The SBS unit provides various services to small-business owners, such as noting how often their incoming callers get a busy signal.

US West's Archuleta: *Customers hate to hold*

Under the old system, service representatives in Phoenix hunted for requested information using as many as three IBM 3270 terminals. But data was scattered across four different cities, and each of the six mainframes — from Unisys Corp., Tandem Computers, Inc. and IBM — contained a separate database with billing records, service plan options or other data.

As a result, representatives lacked a convenient way to determine which database contained the right answers for a particular customer inquiry.

Research confirmed the obvious. "Customers don't really like to be put on hold," Archuleta says.

So US West decided to undertake a major systems overhaul aimed at providing "end-to-end customer service."

Initially, US West thought about using workstations but decided to use X terminals rather than more expensive workstations from Hewlett-Packard Co. and Sun Microsystems, Inc. "We determined the workstations were overkill," Archuleta says. "We didn't leave out any functionality with the X terminals and felt like we would be putting a more easily maintained box on the desk anyway."

The X terminal purchase — initially 1,200 systems and ultimately climbing to 2,100 — cost about $4 million. The remainder will go to servers, software, cabling, training and the like.

The X terminals were rolled out during an aggressive timetable starting in July 1991. The 3270 terminals were replaced while groups of employees attended a four-hour training session. When the employees returned, the new systems were up and running on their desks.

As with any project, there were a few minor surprises, Archuleta says. Planners quickly discovered that users needed access to 10 concurrent sessions, not six as was originally planned. But overall, installation proceeded smoothly.

Waiting time halved

With the new system in place, the average time to handle a call has dropped from five minutes to between two and three minutes, the company says. Instead of logging on and off, workers can open up to 10 sessions concurrently and toggle back and forth to assemble a complete answer.

Officials hope the plan will benefit US West and its customers alike. "With all the competition, if we don't make our customers feel very special, they'll go elsewhere," Archuleta says.

Besides customer goodwill, US West anticipates a concrete return on its $25 million investment. Officials are anticipating a 2% to 6% increase in SBS revenue.

"No single person or project can take all the credit for that, but we know the new customer service system has had an impact," Archuleta says.

Archuleta adds that the overhaul has also proved itself with employees. "Within a week, you couldn't take the X terminals away from the service reps," he says.

In the long term, US West expects the Unix systems to provide a foundation for other new programs. Two weeks ago, DEC announced completion of a $12 million sale of reduced instruction set computing/Unix-based servers and other products and services to the US West unit.

"One of the advantages was that by moving to the open architecture, we can buy from different vendors and leverage that for a little better price," Archuleta says. •

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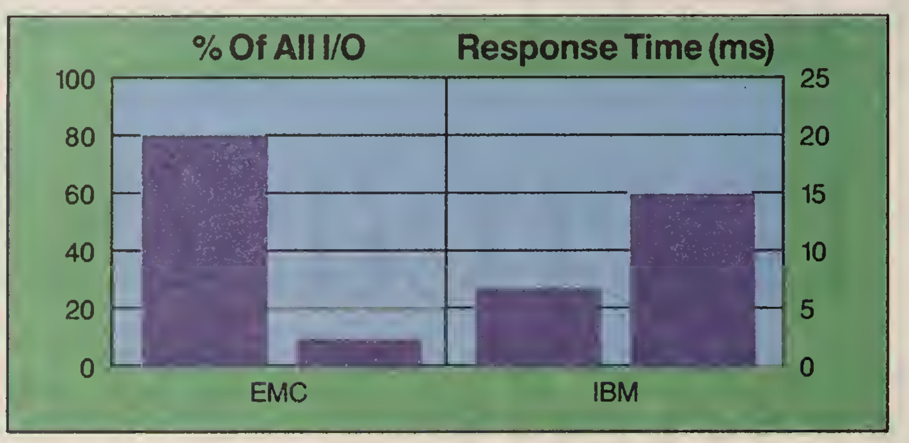

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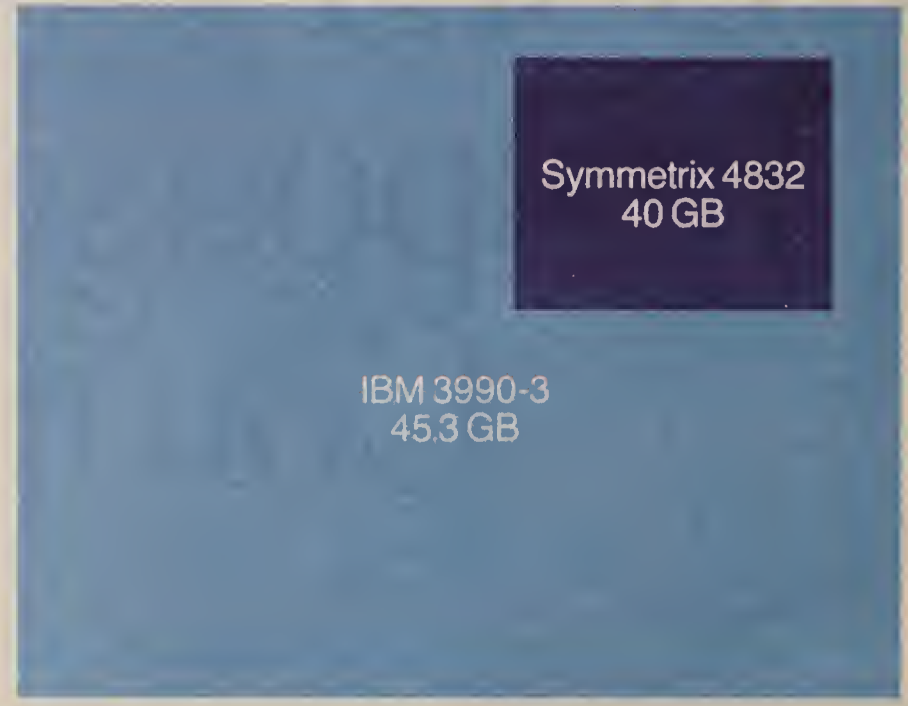

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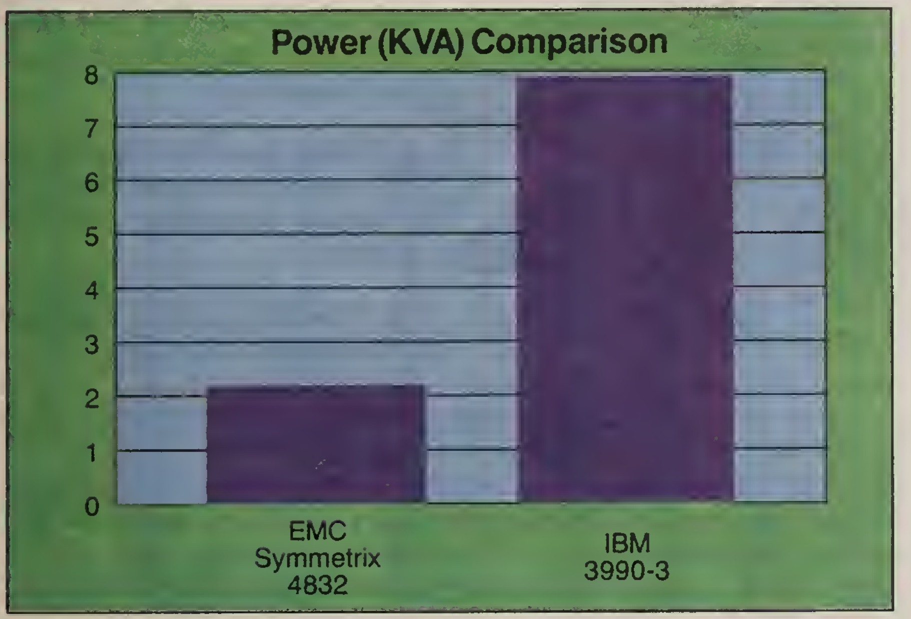

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Meet or beat buyer hopes, expert says

Deloitte & Touche executive says technology must focus more on customers and their needs

John Shaw, vice chairman of service sector strategy at Deloitte & Touche and author of *The Service Focus* (Dow-Jones Irwin, 1990), discussed the role of information systems in customer service with *Computerworld* writer Derek Slater.

Q Companies and technology groups are talking a lot about customer service these days. Why?

A Service touches the customer even more than the product does — regardless of what the product is.

Even if you have a marginal industrial product or even a service product that's difficult to differentiate, like a bank account, how you deliver the product, how you help the customer and deal with inquiries is the place where the business is differentiated.

So "service business" is the single most important application of technology in the company.

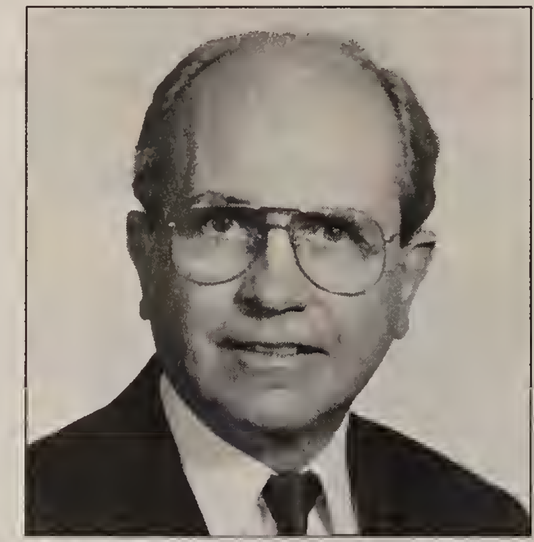
Q Could you give me an example of that?

A If you call the 800 number for Federal Express, you don't have to sit at a Touch-Tone phone hitting a bunch of buttons, which in effect would be doing the work for them. You tell them your ZIP code and the town you're in, and they generally know who you are.

They've taken on the responsibility of knowing who you are as opposed to you entering some code into a Touch-Tone phone. That's an important distinction. It creates an enormous amount of efficiency and good feelings on the part of the customer because they know somebody out there knows them.

Q What can companies do to better use information technology to improve customer service?

A There are three necessary success factors. First, IS groups need to be the low-cost producer of "low-cost transactions": telecommunications, data storage and that sort of thing. There's very little value created, so there's no sense spending a lot of money on it. You've got to do these things very efficiently.



John Shaw: *'Service touches the customer even more than the product does'*

Second is having good applications systems, like the accounts payable system, the payroll system and the logistics system.

It has to work, and it has to work well, but it's the so-called "necessary but not sufficient basis of competition." You have to have it, or you're not in business.

Third is innovation strategy. That's where the service delivery is actually connected to the customer. Through some innovative strategy, the value is delivered to the customer on the customer's terms. You create value for the customers by meeting or exceeding their expectations with a new strategy in areas that are important to them.

Q What are the biggest mistakes companies make when trying to leverage technology for customer service?

A They look at what *they* want to do, what their *own* capabilities are and how *they* want to do it, as opposed to standing in the shoes of their customer and looking in.

The notion is to figure out what's really important to you and me as the customers. •

TECHNOLOGY ROUNDUP

EDI, imaging exploding

BY PAULA JACOBS

Fierce competition for dwindling consumer spending has boosted interest in computer products and technologies designed to improve customer service.

Digital radio networks, automated call distributors and expert systems in particular are drawing high interest, according to Jeff Kaplan, director of Ledgeway/Dataquest, which recently published a services trends study.

Also popular are electronic data interchange (EDI), electronic imaging, inventory management and handheld and laptop computers, he adds.

Firms that want to improve customer service through technology can spend as little as $1,000 for inventory management software or upwards of $500,000 for a sophisticated expert system, for example.

However, users and consultants note that technology often accounts for only a fraction of the overall implementation cost. Generally, a big-time commitment is needed. Planning for an imaging system, for example, can take several months; expert or knowledge-based systems can require a year or more.

Management consultant Bob Ziebig at Nolan, Norton & Co. advises clients to follow some basic but important advice: Before choosing technologies, he says, firms should first evaluate the entire business processes used to provide customer service. Only then are they prepared to look at all the variables, rethink the roles and select the right products.

Customer service technologies vary widely, depending on industry and customer needs. Following is a rundown of some major product areas:

▸Tracking systems

Customer service software tools let firms track problems, the dispatch process and revenue; monitor inventory; and schedule equipment maintenance and installation.

At Sears Business Center, a tracking system tracks the flow of computer parts and products received by the company's 53 computer service areas across the country. The software tracks and controls field engineering dispatching nationwide. Also in use are dispatch and call-handling systems and inventory management systems that let users automatically track service activities.

Canon U.S.A., Inc., which provides technical support for the company's printer division, uses inventory management software from Brock Control Systems, Inc. for customer service. Canon has implemented the Brock Activity Manager System, a series of software modules used in such areas as database marketing, telemarketing, inside sales account management and customer service and support. Canon has customized and integrated the software for its AST Research, Inc. 386 Unix system. The package is priced at approximately $2,800 per user, per module.

MAY WE HELP YOU?

"The first time a customer calls, we enter in the demographic information, product and problem to form a customer profile. We also assign an identification number," says Lee Farrell, product support manager at Canon.

For example, the software gives Canon statistics on how long people wait for a response. Farrell says that information has helped the firm decrease the wait queue and boost the number of calls that can be processed in a given period.

▸Remote service

Limited until 1990 to large private network users, digital radio communications is becoming much more widespread. Advanced Radio Data Information Services, or Ardis, is now commercially available in more than 8,000 locations nationwide. According to a 1991 study by Datapro Research Group in Delran, N.J., Ardis is available in 97% of the nation's metropolitan areas. The 40,000 or so Ardis users across the U.S. include field service personnel from NCR Corp., Pitney Bowes, Inc. and Otis Elevator, Inc.

Ardis uses portable, handheld terminals to access a network and can be used both inside and outside a building. Field technicians can use the portable Ardis terminals at customer sites or in their vehicles to obtain dispatch, diagnostic and service call information. The portable terminal can also be used as a stand-alone radio frequency modem to connect personal computers and data terminals to an Ardis network.

Based on a technology developed jointly by IBM and Motorola, Inc., Ardis provides nationwide, radio-based transmission service using point-to-point, terminal-to-host and host-to-terminal data transmission. It is available from Ardis Co. in Lincolnshire, Ill. Ardis prices range from $100 to $150 per month, per user/terminal.

▸Electronic data interchange

To improve customer service during order entry and shipping, EDI has become a near necessity in health care, pharmaceuticals, wholesale drugs, grocery, automotive and other industries.

Davis & Geck, a division of pharmaceuticals manufacturer American Cyanamid Co., relies on EDI for its purchase orders and invoices to improve efficiency with trading partners, says Larry Smenyak, director of customer service and distributor relations.

The medical supply distributor replaced its existing order system with EDI a year ago and plans to explore EDI use for rebates and possibly for additional transaction sets. The company receives about 72% of customer purchase orders through EDI. With EDI, "we can service more customers directly, achieve at least a 50% reduction in keypunching and reduce head count," Smenyak says.

According to Smenyak, the actual cost ($22,000 for transaction and mapping software from EDI Solutions, Inc.) is not as large as the time commitment the EDI task force invests. "But the end result was worth it, as our customers are very pleased," he says.

▸Expert systems, artificial intelligence

Automating customer service is another way companies are tackling the customer service issue. Expert-based or knowledge-based systems employing artificial intelligence let nonexperts apply knowledge and expertise to problems — in some cases, replacing human interaction.

Kevin McCabe, assistant vice president of the Federal Reserve Bank in Boston, says the bank has moved to the Pegatrace expert system from Pegasystems, Inc. to help resolve and process check investigations. With the system, it has been able to greatly reduce its backlog, McCabe says.

He says the bank was also able to decrease its service staff from 49 to 31, thanks in part to the efficiency of the software. Other specific cost benefits are difficult to measure because customer service was the primary goal of the system implementation, he adds.

Service management tools can also be combined with expert systems, incorporating artificial intelligence to help field engineers diagnose and repair problems more quickly. With artificial intelligence, a field engineer can access an expert database using a laptop computer.

After identifying the product requiring service, a list of symptoms appears. The engineer makes a selection, and the system constructs hypotheses about the causes of the malfunction and recommend the best remedy. •

Jacobs is a Framingham, Mass.-based marketing consultant and writer who specializes in the implementation of new technologies.

Is IBM making the grade?

Big Blue is touting its five major initiatives. A noted IBM watcher gives the company high marks for concept but not follow-through

BY HOWARD FOSDICK

IBM has been a busy little behemoth. It has introduced five major architectural initiatives in as many years: Systems Application Architecture (SAA), the Repository Manager, AD/Cycle, Systemview and the Information Warehouse. Because the company's vision is to have information systems shops mold themselves within these frameworks, it's time to grade IBM on how well these initiatives have fared. Has IBM delivered for IS chiefs? Where has it fallen short, and where has it been successful?

Answers to these questions can help you determine whether you should place your faith in these approaches, ignore them or plot an independent course while tracking them.

The following observations, when put in perspective of your organization's IS needs, will hopefully assist you with your systems decision-making:

SAA

SAA, introduced in 1987, was the first of IBM's grand strategies. It proposes standards for applications portability, technical skills transfer, simpler and more uniform user access and cross-platform development. SAA is made up of four standards: user interfaces, programming interfaces, communications support and common applications.

IS reaction to SAA was positive because its benefits were evident: easier-to-use systems with common interfaces and standards, greatly reduced training needs and increased software portability. However, skeptics wondered how long it would take IBM to implement SAA across the MVS, VM, OS/400 and OS/2 lines of computers and operating systems.

Where does SAA stand five years later? Software vendors have certainly lined up behind it. Few sell software to the IS mainstream without claiming SAA compatibility. SAA has helped standardize both user and programmer interfaces in vendor products and has promoted cross-platform development.

Where SAA has been criticized is the porting of software across the four SAA platforms. While IBM has progressed in this endeavor, it has also dropped its commitment to make all SAA-strategic products available across all platforms, instead opting to make each software component run on what it calls "the appropriate platform." The goals of code portability and cross-systems compatibility have been superceded by that of cooperative processing.

Through cooperative processing, IBM hopes to create what it calls the "enterprise architecture" that ensures its dominance in the personal computer-based world of the future in the same manner in which it has dominated the mainframe-centered world for the past 25 years.

Another disturbing aspect of SAA is its constantly evolving user interface. The company has already advanced three standards — CUA-87, CUA-89 and CUA-91 — as well as numerous variants of these standards. The good news is that IBM changes the SAA user interface to capitalize on new technologies such as graphics and icons. The bad news is that too many standards make for no standard at all.

GRADE: Pass. SAA is a successful philosophy, but its lack of commitment to cross-platform portability and compatibility and shifting interface standards may cause problems.

Repository Manager

IBM announced its Repository Manager strategy simultaneously with AD/Cycle in September 1989, a move that made sense in light of the fact that the Repository underlies organization-wide computer-aided software engineering (CASE).

The repository *concept* is a winner,

Continued on page 82

Fosdick is founder of the Repository-AD/Cycle International Users Group, International DB2 Users Group and Microcomputer Managers Association. He is also president of Fosdick Consulting, Inc. in Villa Park, Ill.

Randall Enos

- **Deciding whether IBM has delivered for IS**
- **A mixed report card**
- **IS chiefs speak their piece**

Continued from page 81

with IS managers saying they are attracted to its goal of storing all CASE information in a company in one place. IS was faced with a fragmented CASE marketplace, with no clear vendor leaders or standards to follow.

At the time of Repository's announcement, many IS sites were using CASE tools from IBM's AD/Cycle business partners, but they had no way to integrate their underlying information models. What could be better than a Repository to tie those tools together? DB2's lack of a data dictionary heightened this initial enthusiasm.

Unfortunately, IBM has not been able to capitalize on IS' desperate need for its Repository. Repository Manager/MVS runs at less than two dozen sites, and a half-dozen early users have returned it. These user experiences indicate that it's big, it's sloppy and it runs like a dog on L-dopa.

While a few products work directly with the Repository, vendors don't need to link their products directly to the Repository to fit into IBM's CASE strategy. Many vendors will just write batch interfaces for their CASE products or simply translate their CASE models into Cross System Product's (CSP) External Source Format.

With the mainframe Repository yet to be delivered in working order, IBM's promises of networked or local-area network versions seem vacuous. As it stands, the Repository is in the unfavorable position of representing the old mainframe way of doing things during the era of downsizing. To make matters worse, the repositories for the three other SAA platforms (VM, OS/400 and OS/2) are still vaporware.

As a final insult, IBM's own Systemview and Information Warehouse products fail to use the Repository's information model and instead opt for using their own. This sabotages the Repository's role as a unifying force within IS.

About the only good news concerning the Repository is that products from business partners Knowledgeware, Inc., Bachman Information Systems and Intersolv, Inc. now work with it. This is a first step toward meeting IS' need for the integration of CASE models.

GRADE: Fail. The Repository is too mainframe, too late.

Incredibly, IS needs it so badly that the Repository could still find a wide audience of users — if it ever works.

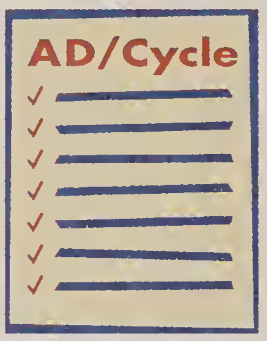
IBM's report card

If this were second grade, some remedial help would be recommended

Strategy:	Debuted:	Grade:	Comment:
SAA	1987	Pass	A major influence on IS and software vendors. A nice philosophy, don't you think?
Repository Manager	1989	Fail	Too mainframe, too late.
AD/Cycle	1989	Incomplete *(promising)*	IBM wins by proxy — the business partners were already the market leaders before AD/Cycle.
Systemview	1990	Incomplete *(not promising)*	What's in a name? Is this anything beyond a collection of existing products?
Information Warehouse	1991	Incomplete *(promising)*	Off to a great start — addresses real IS problems. Recognizes heterogeneity, too!

Source: Howard Fosdick

CW Chart: Marie Haines



AD/Cycle, introduced in 1989, is IBM's CASE strategy. It is based on a cooperative processing architecture, with desktop machines running front-end CASE tools for design and analysis and mainframes providing central control and back-end services. Ironically, IBM has been much more successful in this CASE strategy than in producing the Repository that underlies it.

Through AD/Cycle, IBM stabilized a previously chaotic CASE market. From no presence at all in the CASE marketplace, IBM achieved instant credibility simply by selecting three vendors as its AD/Cycle "business partners":

- Knowledgeware, for cross-life cycle CASE.
- Intersolv, for front-end (or "upper") CASE.
- Bachman Information Systems, for database design and re-engineering.

A more rational marketplace (including viable competitors to IBM) makes it possible for IS to have a more orderly evolution into new technologies.

In terms of specific AD/Cycle products, they run the gamut from insignificant to successful. On the insignificant side, Workstation Interactive Test Tool, Software Analysis Test Tool and Devefopmate have few users and little impact on IS.

Other IBM offerings are question marks. Because of their relative short lifespans in the commercial world, the following products introduced in September 1991 must still prove themselves:

- The AD/Cycle Workstation Platform/2: OS/2-based application programming interfaces for AD/Cycle graphics and library and end-user interface services.
- AD/Cycle Cooperative Development Environment/370: a set of products that supports the programming phase of AD/Cycle on the workstation.
- The AD/Cycle Dictionary Services tool: a traditional data dictionary tool built on top of the Repository Manager/MVS.
- AD/Cycle Fastref/2: an impact-analysis tool for predicting the effects of application changes.

OS/2, for its part, is surviving. It remains the desktop operating system for AD/Cycle. The fact that numerous CASE tools work under OS/2, including those from IBM's AD/Cycle business partners, will help OS/2 fight negative press and the challenge from Microsoft Corp.'s Windows. Early reports claim that OS/2 Version 2.0 is "a better DOS than DOS and a better Windows than Windows."

IBM has succeeded handily with some of the underlying AD/Cycle technologies. For example, DB2 is the database management system of choice for MVS, with some 6,000 installations worldwide.

CSP has overcome its once-poor reputation with Version 3. IBM has resolved problems with CSP library management and workstation support that plagued earlier versions.

The company now offers a full-functioned workstation version of this product in its new OS/2 CSP. CSP's use is growing: A recent survey of some 335 DB2 users showed it as the leading applications generator.

AD/Cycle has progressed during its two-year history. IBM's business partners have released OS/2 versions of their tools, and the user interfaces have been upgraded to SAA compliance.

GRADE: Incomplete but promising. IBM did some quick thinking with AD/Cycle. It achieved instant credibility through business partner alliances. It has had solid performances from products such as OS/2, DB2 and CSP.

Continued on page 84

IS executives aren't thrilled with IBM's performance

Gail Port
Vice president, systems development
Citibank
New York

We categorize ourselves as an organization that started out interested in IBM's initiatives. If IBM had been able to deliver when it made its various announcements, we still might be interested today. Up until a few years ago, we were strictly a mainframe environment, and we do still have a lot of systems on the mainframe, but there is no new development going on for strictly mainframe-based systems.

As we've moved away from our mainframe processing and built more applications in a PC LAN environment, IBM just hasn't been a very big player for us. SAA has become irrelevant. We're keeping an eye on what IBM is doing, but it doesn't mean very much anymore because what we're looking at now are industry standards — open system initiatives, Open Software Foundation work, Unix, C. SAA just doesn't play into that very well. It may show consistency in IBM's product line, but even so, it's still more of a promise than something that's been delivered.

We've been involved in AD/Cycle, but IBM has missed the boat there as well in terms of the target platform — it's too mainframe-based.

Donnette Bruno
Data administrator, IRM
Barnett Bank
Jacksonville, Fla.
Also president of Repository-AD/Cycle International Users Group

IBM has excelled in architecture ideas, but it is missing pieces that are badly needed in terms of Repository and AD/Cycle. However, I can't say that users are entirely blameless. Most of the companies clamoring for these initiatives aren't positioned to use them if they were thrown at them tomorrow. They haven't done the information engineering, the modeling, the defining of data and their processes to use Repository constructively.

Many companies are unfortunately employing CASE tools just to generate code without doing the front-end planning they need to. They are in no great shape to use Repository. They are in shape to put in something that will end up becoming shelfware in a few years.

While Systemview is still a lot of talk, I think it will have a good impact on potential users. It's going to force companies to take a catalog of their hardware, software, networks and programs.

The debate remains about when IBM will deliver on its promises and how it will deliver. While that debate is important for users interested in following IBM's plans, what's more important is that they start some long-term planning efforts now.

Pete Clark
System programming administrator
Olan Mills, Inc.
Chattanooga, Tenn.

We have worn out the presses discussing, talking and writing about SAA. If half of the effort had been put into deliverables as has been put into publicity, maybe we would have something today. We've needed a lot for two or three years now.

IBM has excelled in announcements. SAA, for example, is a real nice idea, but IBM has been slow to deliver. It hasn't held us back at this point, but it hasn't enabled us to move ahead either. The normal way of doing business continues to be getting around what we can't have now.

Keep in mind that while a lot of people are saying they want what IBM is offering, until people are willing to spend their money, I wouldn't put a whole lot of faith in what they say.

We in IS are in a difficult position because management reads something about what IBM is doing, thinking everything is available. They ask us why we aren't implementing [those initiatives]. Well, we aren't implementing because there is no such thing — it is not available, it has not been developed.

What IBM is doing with its initiatives is a topical issue.

Unfortunately, because much of the functionality is not yet available, it's not something that most people have had a lot of experience in.

New technology can seem a little intimidating.

Investments in information technology have reached 40% of U.S. capital spending. Yet national productivity has not improved since 1973.

So anxiety over new spending is justifiable, even healthy. The evidence is that hardware alone doesn't pay off. Which is why Andersen Consulting offers something even more powerful.

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Where we go from here.℠

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Continued from page 82

Systemview

This section will be short — little has happened to Systemview beyond announcements. Systemview promises to manage heterogeneous, enterprisewide information systems. It manages host, business administration, network, storage and database resources. Systemview's end-user dimension ensures SAA user interfaces for these IS management products; the application dimension defines guidelines for the product integration; while the data dimension proposes standardized systems management data storage.

The goal is improved product integration and increased automation for IS systems management software.

IBM selected Platinum Technology, Candle Corp., Bachman Information Systems, Goal Systems International, Inc. and the Information Retrieval Cos. for its Systemview business partners. A question remains: While these vendors offer a great group of products, does that make them an architecture?

So far, all that has happened is that these companies have upgraded their products' user interfaces to SAA compliance. Meanwhile, because several vendors rejected offers to become Systemview partners, it appears that IBM is having difficulty in orchestrating its Systemview strategy. For their part, industry analysts expressed dismay that Systemview uses its own repository rather than Repository Manager/MVS.

IBM's own Systemview products include Netview, IBM Operations Planning and Control, Problem Management Productivity Services and Failure Analysis and Support Technology Service, among others. While individual products may turn out to be adequate, the product set as a whole is ill-defined and confusing. Systemview offers no design coherency, which is not the way to attract users.

GRADE: Incomplete. The bottom line on Systemview is that it's too early for a bottom line. There's been more talk than actual product delivery.

Information Warehouse

Like the Repository, the Information Warehouse identifies a critical need within IS. It aids in retrieval of information, regardless of platform or location. But unlike the Repository, the Information Warehouse (in an early form) works today.

Introduced last September, the Information Warehouse facilitates decision-support systems. The Information Warehouse distinguishes between "operational databases," which support critical applications and reflect the state of the business in real time, and "informational databases," which contain data workers can use for interactive decision support.

For its part, IBM will provide the long-awaited remote unit of work capability to its four relational SAA database management systems by March 1992. The remote unit of work feature transparently routes SQL transactions to the proper location within a database network. IBM supports data propagation to the Information Warehouse by Data Extract Facility, the Data Propagator and a new feature called RRDF Log Apply, which updates a "shadow copy" of selected DB2 tables at a remote site.

Finally, IBM has long had many decision-support products it now promotes as tools for the Information Warehouse.

The centerpiece of the Information Warehouse announcement is the Enterprise Data Access/SQL family of products from Information Builders, Inc. The Information Builders products permit data access from more than 45 DBMSs and file structures, residing on more than 35 different platforms and using a dozen common communications protocols. SQL is the universal data retrieval language that programmers employ through an application programming interface. They don't need knowledge of underlying communications protocols. Extender interfaces link existing products to the Information Builders data access network.

IBM has promised more to come. The company recognizes that the setup, administration and coordination of data copying between the operational and informational databases challenges the typical IS shop.

Therefore, it is working on a business information directory to handle the mapping between the databases as well as a process manager to automate the copy processes. While IS expertise, personnel and administration will still be necessary, IBM is allocating its resources to address the right problems.

GRADE: Incomplete but promising. The Information Warehouse concept shows that IBM understands heterogeneity. It looks good so far, with IBM delivering value and addressing IS' data access problem through its partnership with Information Builders.

……

The final judgment on the bulk of IBM's major initiatives is still out. Because of this uncertainty, even IBM diehards will have to make sure they are balancing what their IS shops need now with what IBM can deliver.

Besides, should there be a need in your shop that IBM has not yet addressed with one of its strategies, all you have to do is wait until next September. •

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COMPUTER INDUSTRY

NATIONAL BRIEFS

Going for the gold

▶ Among those attempting records at the winter Olympics in Albertville, France, is **Andersen Consulting**. The Andersen-engineered Info 92 is a 1,700-machine personal computer network that will let users (including spectators) share weather forecasts, transportation scheduling and, of course, information about the athletes and the events. The network will span 700 square miles of mountain area — a project that Benoit de Chassey, information systems chief for the French organizing committee, likened to running a major airport. The automation of all components — operational management, scoring and a data bank for journalists — is a first, according to Andersen.

Coming out of the dark

▶ Less than a year after filing under Chapter 11, word processing pioneer **NBI, Inc.** last week announced its imminent emergence from bankruptcy — fueled by a reorganization plan that won approval from approximately 95% of the creditors whose demands once sent the firm scurrying for court protection. Under the plan, NBI creditors will swap some $50 million of debt for common stock. Their show of confidence, an NBI spokeswoman said, can be credited to the company's recent aggressive moves into the Microsoft Corp. Windows word processing market.

Continued on page 88

Bush trip yields high-tech silver lining

ANALYSIS

BY GARY H. ANTHES
CW STAFF

President Bush may have made modest gains in Tokyo for American automobile companies, but the U.S. computer industry scored a major success there, winning pledges that could boost U.S. sales to Japan by several billion dollars per year.

The Japanese government said it will take a number of steps to open its $12 billion-plus public sector market to purchases of foreign computers, software and services, which now come almost exclusively from Japanese vendors. Industry sources hailed the agreement, saying it is more likely to bear fruit than some Japanese pledges because the government can change its own buying behavior far more easily than it can influence the purchases of private Japanese companies.

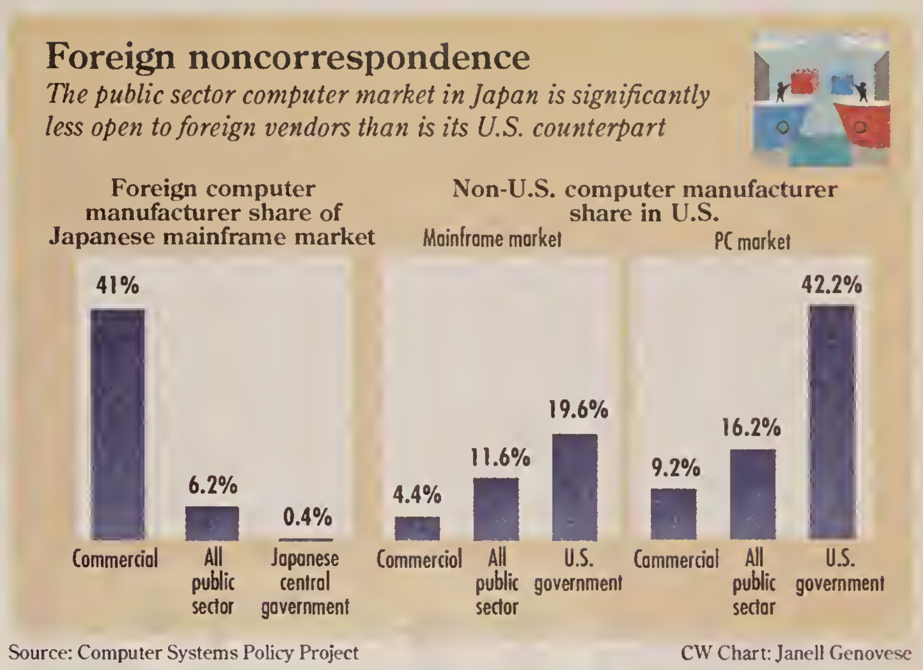
"Our agreement on government computer procurement will open up additional opportunities for U.S. companies," Bush said during a Tokyo press conference.

Kenneth Kay, executive director of the Computer Systems Policy Project (CSPP), said the agreement came as no surprise, but the speed with which it was reached was astonishing. Negotiations began last month.

Kay said U.S. computer buyers will also win. "Users have a vested interest in the overall health of the U.S. computer industry. Users want computer companies to succeed in opening closed markets," he said.

According to a CSPP study, non-Japanese mainframe ven-

Continued on page 88



Foreign noncorrespondence

The public sector computer market in Japan is significantly less open to foreign vendors than is its U.S. counterpart

Source: Computer Systems Policy Project

CW Chart: Janell Genovese

COURT REPORT

■ Iowa State University recently gave failing grades in fair competition to two Japanese fax machine manufacturers. According to complaints filed in Des Moines, Iowa, on Dec. 31, NEC Corp. and Murata Manufacturing Co. infringed on the university's 1973 patent for a key process used in high-speed fax machines. The patent actually expired in December 1990, but the school is suing for back royalties on NEC and Murata sales between May 1985 and the expiration date — a sum it says will translate into millions of dollars. The legal route is not a new one for Iowa State: The university has reportedly reached settlement agreements with several other vendors over the patent at issue, including another fax player: Canon, Inc.

■ As the Roaring '80s recede into history, a new climate of disclosure and vigilance may well be turning up the heat under companies' accounting and reporting habits — but the new accountability isn't singeing Data General Corp. Earlier this month, federal district Judge Rya Zobel dismissed a class action suit brought against the systems vendor and several of its officers and directors for allegedly making misleading statements about the firm's financial performance and prospects.

The stockholders' complaint, Zobel said, failed to provide a factual basis for its "hypothetical tale of deception."

■ Users confused or concerned about being caught in the legal crossfire as Irvine, Calif.-based Toshiba America Electric Components, Inc. and Lowell, Mass.-based Wang Laboratories, Inc. battle over single-in-line memory module (SIMM) rights recently got some comfort from the federal court.

An earlier stage of the ongoing case resulted in the court's issuing a permanent injunction barring Toshiba from selling any of its so-called X9 SIMMs in the U.S. after Oct. 8, 1991. Wang subsequently sent letters to users warning that they might be seen as "in active concert with" Toshiba — and in violation of the injunction — through their ownership of X9 SIMMs.

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1992 Computerworld Editorial Calendar (January-June)

Issue Date	Ad Closings		Editorial Feature	Show Distribution	Ad Readership Issue	Response Card Decks
	Color*	B/W				
Jan. 6	Dec. 20	Dec. 27	**Executive Report:** The Information Systems Contribution to Quality			
Jan. 13	Dec. 27	Jan. 3	**Product Spotlight:** Windows Applications			Mails: Jan. 15 Space Close: Dec. 6 Mat'l Close: Dec. 9
Jan. 20	Jan. 3	Jan. 10	**Executive Report:** Customer Service **Industry Closeup:** Automotive Industry			
Jan. 27	Jan. 10	Jan. 17	**Product Spotlight/Buyers' Scorecard:** LAN Management	Communication Networks Jan. 28-30 Washington, D.C. Windows OS/2 Jan. 28-30, San Jose, CA	Harvey Study	
Feb. 3	Jan. 17	Jan. 24	**Executive Report:** Using IS for Fast Track Product Development			
Feb. 10	Jan. 24	Jan. 31	**Product Spotlight:** E-Mail	Networld Feb. 11-13, Boston	Starch Study	Mails: Feb. 12 Space Close: Jan. 3 Mat'l Close: Jan. 6
Feb. 17	Jan. 31	Feb. 7	**Executive Report:** Beyond Sales Force Automation			
Feb. 24	Feb. 7	Feb. 14	**Product Spotlight/Buyers' Scorecard:** Accounting Systems			
Mar. 2	Feb. 14	Feb. 21	**Executive Report:** Information Systems at the Point of Customer Contact			
Mar. 9	Feb. 21	Feb. 28	**Product Spotlight/Buyer's Scorecard:** Client/Server Application Development		Starch Study	Mails: Mar. 11 Space Close: Jan. 31 Mat'l Close: Feb. 3
Mar. 16	Feb. 28	Mar. 6	**Integration Strategies:** Pulling Macs Into the Enterprise Network **Industry Closeup:** Aerospace			
Mar. 23	Mar. 6	Mar. 13	**Product Spotlight/Buyers' Scorecard:** RISC Desktop Machines and Servers	DB Expo Mar. 23-26 San Francisco	Starch Study	
Mar. 30	Mar. 13	Mar. 20	**Executive Report:** Outsourcing: Interim Solution or Long Term Strategy?			
Apr. 6	Mar. 20	Mar. 27	**Product Spotlight/Buyers' Scorecard:** PC Software—Fresh Application Categories and New Twists on Old Ones	Comdex Spring '92 and Windows World Apr. 6-9, Chicago		
Apr. 13	Mar. 27	Apr. 3	**Executive Report:** To Be Announced			Mails: Apr. 15 Space Close: Apr. 3 Mat'l Close: Apr. 6
Apr. 20	Apr. 3	Apr. 10	**Product Spotlight/Buyer's Scorecard:** Printers Best Suited for a LAN Environment			
Apr. 27	Apr. 10	Apr. 17	**Executive Report:** To Be Announced		Starch Study	
May 4	Apr. 17	Apr. 24	**Product Spotlight/Buyer's Scorecard:** Midrange Systems That Run Enterprises			
May 11	Apr. 24	May 1	**Integration Strategies:** Creating an "Open" Company **Industry Closeup:** Personal Care Industry		Starch Study	Mails: May 13 Space Close: Apr. 3 Mat'l Close: Apr. 6
May 18	May 1	May 8	**Product Spotlight/Buyers' Scorecard:** Routers	Interop East May 18-22 Washington, D.C.		
May 25	May 8	May 15	**Executive Report:** To Be Announced			
June 1	May 15	May 22	**Product Spotlight:** What the Well-Equipped Help Desk is Using			
June 8	May 22	May 29	**Product Spotlight/Buyer's Scorecard:** MRP II			Mails: June 10 Space Close: May 1 Mat'l Close: May 4
June 15	May 29	June 5	**Special Edition:** Annual *Premier 100* Magazine (Ad Close: May 1) **Executive Report:** To Be Announced			
June 22	June 5	June 12	SPECIAL SUPPLEMENT: *Computerworld's* 25th Anniversary **Product Spotlight/Buyers' Scorecard:** Portable Computing (laptops, notebooks, pen-based and wireless technologies)	PC Expo June 23-25 New York City AIIM June 22-25 Anaheim	Starch Study	
June 29	June 12	June 19	**Executive Report:** To Be Announced			

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Q4: Surprises in scant supply

Observers say it's time to look past quarterly numbers for bellwethers

ANALYSIS

BY NELL MARGOLIS
and KIM S. NASH
CW STAFF

It's a disaster. It's a dilemma. Depending on where you stand and what you choose to see, analysts noted earlier this month, the computer industry's fourth quarter of 1991 can be safely characterized as almost anything — except a surprise.

"Fundamentally, the fourth quarter was a poor one for computer firms," said Peter Labe, an analyst at New York-based Labe & Co. "I think it's safe to assume that has already telegraphed to everyone who can read."

Trends once seen as distorting computer firms' earnings and profits — the domestic recession, financial unrest spreading worldwide, the impact of currency translations in a suddenly globalized industry and, of course, the rapidly changing breadth and depth of user demand — are being accepted, albeit reluctantly, as shaping bottom lines.

One result, several analysts said, is that quarterly results — a measure already under fire by critics who see U.S. industry as handicapped by short-term thinking in a worldwide marketplace where long-term strategy rules — may be at an all-time high of irrelevance.

Analysts pointed to a host of traditional industry bellwether firms as good candidates for overlooking in the fourth calendar quarter: Digital Equipment Corp., Lotus Development Corp., Borland International, Inc. and Computer Associates International, Inc., for instance, are widely expected to report fourth quarters ranging from disappointing to underwhelming. But they are also viewed as good bets for product-fueled booms as 1992 unfolds.

On the other hand, analysts qualified comments on Sun Microsystems, Inc.'s estimated fourth-quarter strength with concerns over how the workstation leader's bottom line will hold up in the coming year, which promises unprecedented competition from IBM, Hewlett-Packard Co. and DEC. Said Alex. Brown & Sons, Inc. analyst Joseph Payne, "This is the quarter of 'who knows?' "

LARGE SYSTEMS: "The industry's bleeding," Payne said, and few voices from Wall Street disagreed.

The $3 billion charge IBM said it would take against fourth-quarter earnings will leave the company with a significant quarterly loss — and, according to analysts — in all likelihood with its first annual revenue drop in close to five decades. Estimates of exactly how much red ink will spill at Big Blue vary widely, from the $30 million range to near $1 billion. However, analysts also widely expect IBM to post operating profits in the $1.5 billion range for the quarter closed Dec. 31.

DEC, too — still amid expensive business restructurings and product-line transitions — took a widely predicted fourth-quarter beating.

Unisys Corp.'s draconian cost-cutting is likely to deliver the firm back into the black after two years of loss quarters; however, Payne said, the profit — anticipated around $24 million — will be earned on revenue down an estimated 15% year over year. A relatively flat quarter is expected from HP, which is anticipated to report marginal sales and profit increases next month and could be the high end's high point, several analysts said.

PCS AND WORKSTATIONS: Bruised by breakneck competition and drained by the unexpectedly long recession, the once-triumphant personal computer market will shine in the fourth quarter, but only in comparison with the battered high end, analysts said.

Better-than-expected sales of Compaq Computer Corp.'s competitively priced new boxes caused several analysts to raise their estimates on the beleaguered market leader, but Wall Street still foresees a steep year-over-year fourth-quarter decline in both revenue and profit.

Apple Computer, Inc. should report a revenue increase of some 7% to about $1.8 billion, said Hambrecht & Quist, Inc. analyst Bruce Lupatkin; however, he added, he anticipates Apple's profit to be off 20%. Sun Microsystems, Inc. could be one of the sector's brighter spots, several analysts said; the workstation player is expected to post net income up some 15% to approximately $45 million on revenue increased 16% to $870 million.

Another source of smiles should be fault-tolerant computer maker Stratus Computer, Inc., Montgomery Securities analyst John B. Jones Jr. said. Unlike rival Tandem Computers, Inc., still hobbled by restructuring costs, Stratus is expected to report profit up 23% to $16 million on revenue increased 8% to $128 million.

SOFTWARE: Anticipated hardware sales have not kicked in in time to boost hardware vendors' fourth-quarter results, Lupatkin noted. Nevertheless, they were a major factor behind a relatively upbeat quarter in the software sector.

Microsoft Corp. and Symantec Corp. both are expected to reap the bottom-line benefits of strategic acquisitions as well as warmly received products, the former surging 35% to approximately $615 million, and the latter spurting ahead an estimated 57% to $54 million. Informix Corp. and The Ask Cos. should be looking good in the fourth quarter, said Martin Simpson & Co. analyst Charlotte Walker.

INTERNATIONAL BRIEFS

Merger minus

▶ Denmark's **ICL Data A/S**, a merger effort between **Nokia Data** and **RC International** (RCI), will lay off approximately 150 of its 650 employees, with the ax falling particularly on those who came to the firm from RCI, according to a recent announcement in the Danish business press. After two profitable years, RCI experienced heavy losses in 1991, largely because of a 50% falloff in exports and a substantial drop in the company's telecommunications business. Export figures dropped to $2.5 million — $4.2 million below plan.

Union dues

▶ Unions at Italian computer manufacturer **Ing. C. Olivetti SpA** are poised to petition the Italian government for aid in the wake of Olivetti's recent announcement of impending layoffs, according to a report in the European business press. The unions, which were due to meet with company officials earlier this month, said they requested a meeting with government representatives to discuss the situation. Olivetti has said it will have to cut its domestic work force by 2,500 jobs this year, over and above the 3,000 shed in 1991.

Still on the line

▶ Despite recent market liberalization, state-owned Spanish telecommunications operator **Telefonica de Espana SA** intends to retain between 70% and 75% of the domestic telephone services market, according to a report in the French newspaper *Les Echos* earlier this month. In the six months that the niche has been open to competition, Telefonica has managed to keep its grasp on 87% of the business. Nor, apparently, does it intend to lay down its receiver: According to the report, the state arm has allocated $28 million to advertising in the newly contested niche this year.

Fruit of their labor

▶ Cooperative efforts between **Mitsubishi Electric Corp.** in Japan and Germany-based **Daimler-Benz AG** are beginning to bear fruit. Earlier this month, the firms announced a preliminary agreement under which a Daimler group company, **AEG AG**, will manufacture integrated circuits for Mitsubishi to use in televisions. AEG is expected to sign a formal second-source agreement later this month; production is slated to start in April.

NATIONAL BRIEFS

Where the chips fall . . .

▶ According to a preliminary report by Dataquest, Inc., a market research firm in San Jose, Calif., **Intel Corp.** passed **Motorola, Inc.** last year to become the largest U.S. semiconductor maker and fourth largest in the world, behind NEC Corp., Toshiba Corp. and Hitachi Ltd. Intel's average growth in the past five years has been 32.6%.

. . . and where they no longer do

▶ **LSI Logic Corp.** earlier this month became the first founding member to withdraw from Austin, Texas-based semiconductor research consortium **Sematech**. Disagreements over Sematech's agenda and the failure of that agenda to dovetail with LSI's own strategies reportedly drove the Milpitas, Calif.-based firm to sever its ties with the consortium it helped spearhead in 1987.

Bush trip yields silver lining

CONTINUED FROM PAGE 85

dors have won 41% of the $16 billion Japanese commercial market for mainframes but only 6.2% of the $3 billion public mainframe market, made up of national and local government, schools and hospitals. The national government buys only 0.4% of its mainframes from foreign suppliers, according to the CSPP study.

In contrast, foreign mainframes account for 19.6% of U.S. government installations, the CSPP found.

William Krist, vice president for international trade at the American Electronics Association, cited the 41% share of the Japanese commercial mainframe market won by non-Japanese firms as "proof positive of the high quality and acceptability of our products in the Japanese marketplace."

A trade official at a large U.S. computer firm who asked not to be named added, "We're getting $4 out of $10 in the toughest market in the world. This is not a matter of selling right-hand drive cars. We've proven we can compete on an equal basis if given a chance."

To give the U.S. that chance, Japan said it will do the following:

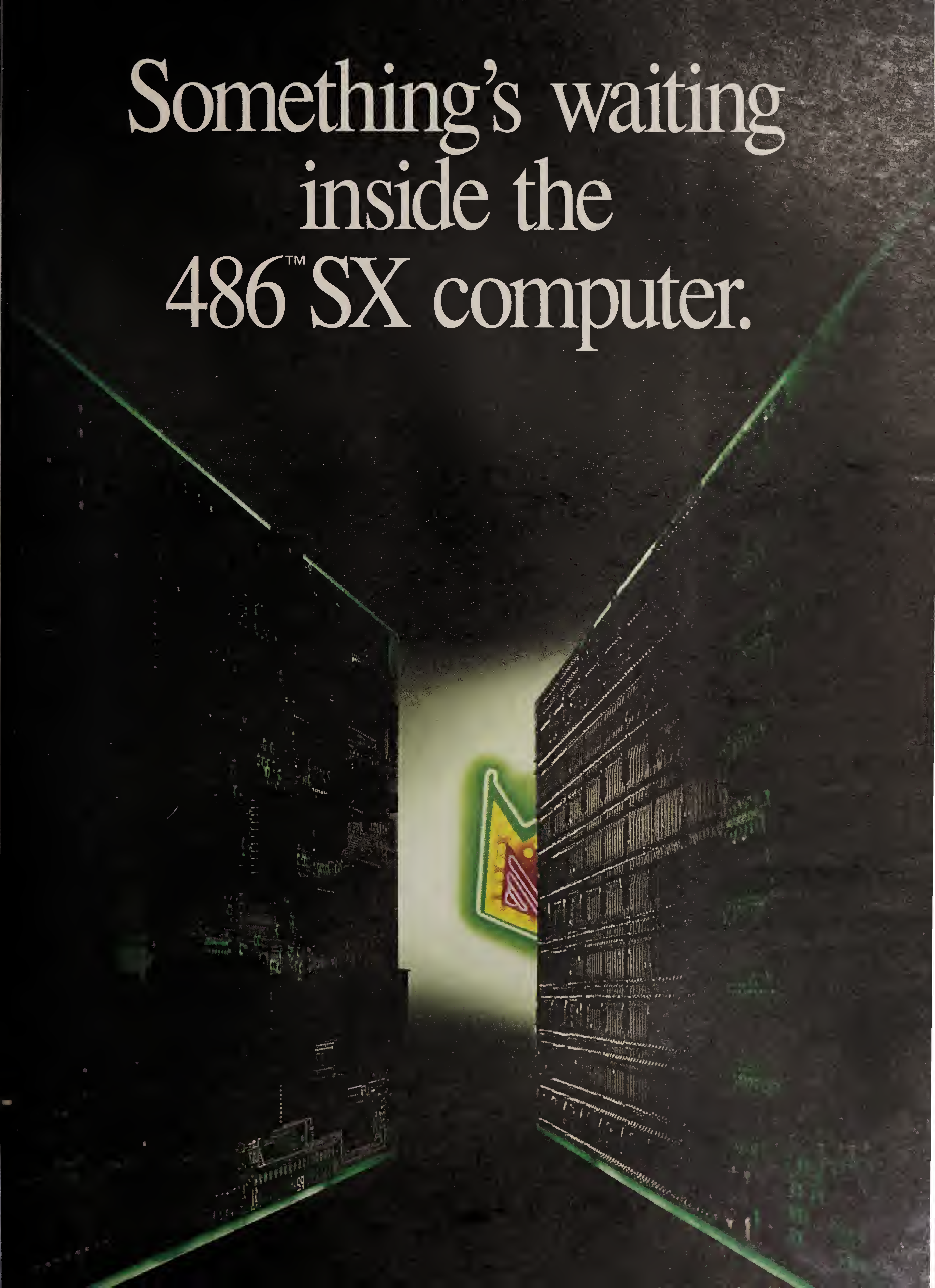
- Ensure that foreign and domestic suppliers get equal access to prebid information.
- Formulate technical specifications in a neutral, nondiscriminatory manner and allow equal access by foreign companies to specification-setting study groups.
- Reduce the use of sole-source contracts.
- Award contracts on the basis of performance as well as price and improve the "transparency" of contract-award criteria.
- Promote multivendor open systems environments.
- Establish an impartial bid protest system.

> THE AGREEMENT IS intended to wipe out the persistent effects of a "buy Japanese" government policy.

The agreement is to apply to all purchases exceeding approximately $140,000 in value. The effective date for hardware and software products will be April 1, and for services including software development, Oct. 1.

The terms of the agreement are intended to wipe out the persistent effects of a "buy Japanese" government policy implemented in the early 1960s and officially removed in 1978. According to U.S. industry sources, structural barriers remain, including sole-source contracts to domestic vendors, lack of open systems standards, an ineffective bid protest system and participation by Japanese vendors in preparing bid specifications.

If non-Japanese vendors were to capture the same percentage of the Japanese public market now as they have of the commercial market, that would boost their hardware sales by a little more than $2 billion. Moreover, industry sources said that every dollar of increased hardware sales could generate equal or greater revenue in software and services.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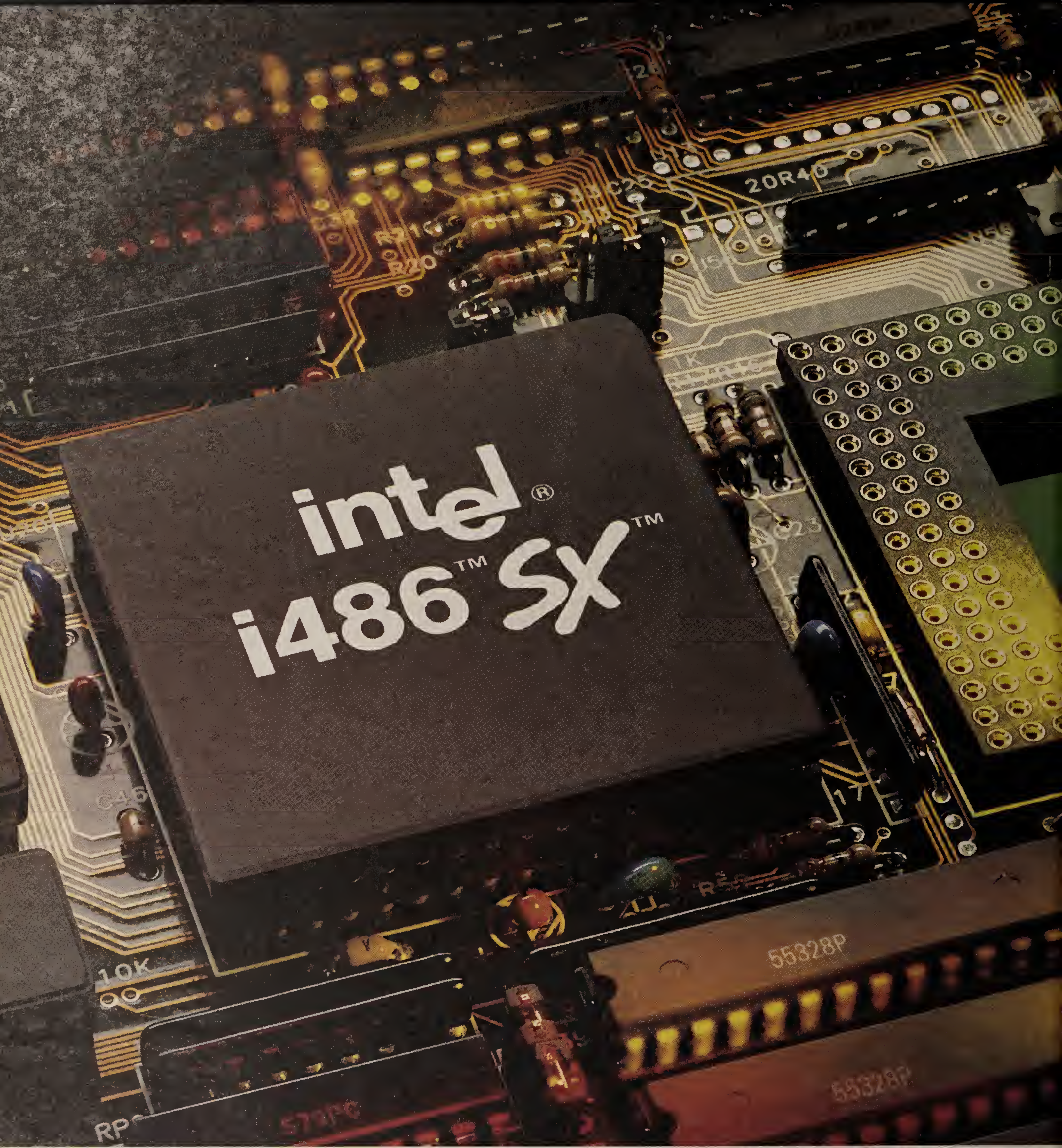

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Presidential politics create jobs, but work is seasonal

BY JULIA KING
SPECIAL TO CW

Providing information systems support for political races is traditionally a boom/bust business, although there has been some increase of late in the number of permanent positions at some organizations.

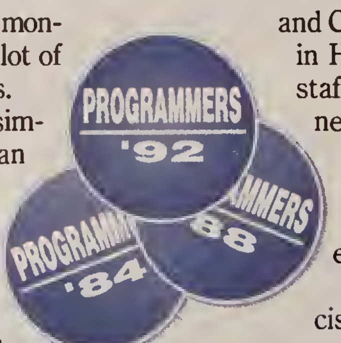
IS professionals hired by computer service bureaus that specialize in maintaining voter databases can expect to put in a lot of overtime and bring home hefty paychecks in 1992. Many of these same IS professionals can also expect to be out of a job nine months from now, when the presidential primary elections, national November balloting and campaign frenzy that precedes them are over.

In previous election years, which tend to fall during even-numbered years, demand for skilled programmers, analysts and computer operators with experience in this niche market has been known to double, only to fall back in off years.

Hiring merry-go-round

"We lay off one-half of our programming staff at the beginning of odd years, then we hire them back on even years," says Frank Tobe, a former systems consultant who is now president of Below, Tobe and Associates, a Marina del Ray, Calif.-based computer services bureau that was contracted to produce customized campaign materials such as letters and canvassing lists for such clients as former California Gov. Jerry Brown and the state Democratic parties in Maryland, West Virginia and New Hampshire.

"This is why we tell programmers from the very start that we can offer them a lot of money this year but not a lot of permanence," he says.



IS hiring follows a similar pattern at American Data Management, another computer services bureau in Mountain View, Calif., that, given the number of new campaigns launched in an election year, does six times more business in those years than in nonelection years, according to company President Doug Winslow.

This feast or famine employment isn't for everyone — nor are the hours. In the six weeks preceding the November election, Tobe says, it is not unusual for IS workers at his firm to put in 12-hour days, six days a week.

The workers best suited for these seasonal posts are those with technical talent, independent ways and a passion for politics, employers say. "These jobs are on the fringe of politics and therefore have the same degree of drama and timing," Tobe says. "The people we tend to attract are itinerant programmers with political interests."

While the majority of jobs are of short duration, it is possible to build an IS career in the political arena. At least three politics-oriented service bureaus — Election Computer Services in New York, Voter Contact Services in Honolulu and Santa Clara, Calif., and Conotabs Networks in Houston — hire IS staffers on a permanent basis, even though the companies do most of their business in election years.

"Our business decision has been to carry people, even though we make most of our money during a few months of the year," says Mike Hannahan, vice president of marketing at Voter Contact Services. "The reason is that for a programmer to become useful to us, it takes about a year to train them."

Permanent job opportunities for programmers are also increasingly becoming available at companies that develop and sell software directly to campaigns.

At Aristotle Industries, Inc. in Washington, D.C., for example, company President John Phillips says he expects to fill between six and 12 new positions for permanent, full-time personal computer programmers during the first two quarters of this year.

In addition to selling PC software programs that track campaign contributions and constituent inquiries, Aristotle Industries compiles and publishes compact disc/read-only memory-based lists of registered voters and works as a contractor, installing systems and training users at various state legislatures.

In both 1990 and 1991, the company doubled its sales and expects to do so again this year, anticipating 1992 revenue of $3 million, according to Phillips.

Such growth, Phillips says, shows that "electioneering is pretty much a year-round business now. People need IS to get elected as well as stay elected."

Political savvy wanted

The service firms that work directly for political campaigns divide along party lines. Employees are not required to declare political allegiance, however, although they are required to sign both noncompetitive and confidentiality agreements.

Of the half-dozen companies interviewed, virtually all said they prefer to hire candidates with political experience, whether it be as volunteers or paid campaign workers or as employees of another service bureau that does political work.

"Because the whole election business takes place in a very tight time schedule, there is a certain amount of political savvy one needs to have," says Margo Marabon, president of Election Computer Services, which is now recruiting computer operators to work through November.

For example, Marabon says, a programmer at her company may be required to assemble a database of names representing registered voters between certain ages who live in the same household but are members of different political parties. "The person we hire to do this has to understand the numbers and why they are important," she says.

King is a free-lance technology writer based in Ridley Park, Pa.

Supporting the supporters

Despite the fact that this is a presidential election year, neither the two major parties' national organizations nor their campaign committees plan to increase their IS staffs significantly. One reason is that given the availability of new PC-based campaign-related software, more state and local campaigns are relying on volunteers to help with their IS work.

Given this trend, "there is a possibility that we may need to hire people to provide end-user support so that campaigns can use information more efficiently," says KC Hullings, MIS director for the Democratic National Committee. The bottom line, however, is that the committee's five-member IS staff remains "pretty constant" in both election and nonelection years, Hullings says.

JULIA KING

THE INTERNATIONAL ATOMIC ENERGY AGENCY

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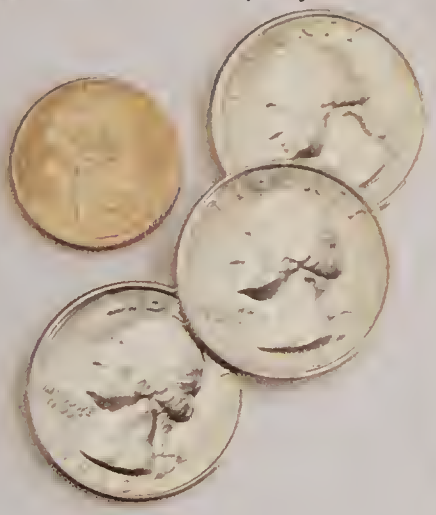

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MANAGING YOUR CAREER

Blair Jensen

How to figure out what others expect of you

You've got your career goals down: You've quickly risen from programmer analyst to senior analyst to project manager, and you have a serious shot at information systems manager. You've taken all the right technical and business courses and had all the right hands-on training.

You're on your way, right? Well, maybe not.

There is a whole constellation of needs and expectations that can impact an IS career — those of top management, business unit clients, IS managers and team leaders. Identifying, sorting and prioritizing all of these expectations can be difficult, especially because not all of those professionals you interact with will be very good at articulating their expectations or connecting them to your job.

There are, however, a number of information sources you can tap and actions you can take that will help you to better understand what is expected of you and how you can excel:

▶ **The company's mission statement.** Mission statements provide a broad view of what the organization is trying to accomplish.

One thing mission statements have in common is that they identify a company's major focus. You need to look at yourself in the big picture to see what you do and *can* do to meet the firm's objectives.

Also, by finding out what other departments are responsible for, you get a broader picture of how other people's jobs contribute to fulfilling the company's mission and how other jobs impact yours.

As an IS professional, you need to familiarize yourself with each person for whom you work, from immediate supervisors to upper management, to understand the hurdles your superiors face. With this new perspective, you will be able to appreciate each individual's role in the organization.

▶ **The business plan.** Most department heads will have a copy of the section of the company's business plan that pertains to their departments.

Quite often a business plan outlines what each department must do to accomplish corporate goals and provides a means of measuring success. By knowing what a particular department's business goals are, you can tailor all your development and support activities to them. You won't be doing your work in a vacuum.

For instance, your marketing department's business plan may indicate that it wants to increase the number of sales in order to fit in with corporate goals. Its salesmen, who know the business best, have a few innovative projects and ideas to meet those goals. What better way for you to shine than by initiating the development of systems that put those ideas into practice?

▶ **The grapevine.** Don't discount the rumor mill. Ninety percent of what you hear through the grapevine is true. Informal communication with employees at all levels will prepare you for changes in your business and your employer's needs.

For example, if you're working with an end user, you may get a feel for his frustrations and problems, which could actually mirror feelings of users in general. This close contact can often provide an early warning, helping you anticipate changes to the organization.

The company will eventually have to respond to the pressures if a policy doesn't work. While the response can sometimes take weeks or months, your familiarity with the situation gives you the lead time to see what's going to happen in the company. Therefore, you won't be resistant to change when it does take place. You'll be valued as you offer ideas for how technology can support the changes to come.

▶ **Long-term and ad hoc committees.** Committee meetings will give you a first-hand look at the long- and short-term problems that face your employer.

Meetings give you an opportunity to get involved in solving issues that oftentimes don't fall within your regular job responsibilities; they also provide you with a chance to interact with managers on a more informal level and to see managers in action — how they perceive different issues, what kinds of issues they take seriously and how they approach and solve problems.

AS AN IS PROFESSIONAL, you need to familiarize yourself with each person for whom you work, from immediate supervisors to upper management.

Not only is this a benefit to you in that you can learn from the people you work with on the committees, but it also helps you to gain visibility. Others can see how you solve problems outside of the IS environment.

▶ **Information on competitor goings-on.** You can become a valuable resource by understanding your employer's business and that of competitors.

Keeping tabs on successful competitor strategies — or unsuccessful ones — through trade conferences or periodicals can help you put your IS work into perspective. If the rest of your industry is big into electronic data interchange and your company isn't, you may want to look into it.

Also, it may be a good idea to follow stocks of companies in your industry group. Stock fluctuations are usually a good indicator of upcoming change. In this way, you can prepare a host of options for implementing change in your company. You won't be caught unaware.

Understanding your specialty will make you a good employee. Understanding your employer's specialty will make you an excellent employee.

▶ **Talk to the company's customers.** While it is unlikely that you will come in contact with your company's customers on a daily basis, you might come in casual contact with a customer in a social setting or at a conference or seminar. Take the opportunity to find out whether your company is satisfying the customer's needs. Use this knowledge to make sure you and your IS group are doing all you can to be responsive to the customer. That means you're also being responsive to your employer.

While this may seem like a heavy research burden, time spent investigating the goals and requirements of those for whom and with whom you work will be well spent. If you understand your bosses, your peers and your clients well enough to fulfill all of their needs, there is an excellent chance that the company will satisfy yours.

Jensen is an IS manager at the Utah State Developmental Center in American Fork, Utah.

IS managers and corporate hiring managers: If you have a career issue you'd like to write about, please fax your idea to Kelly Dwyer, (508) 875-8931.

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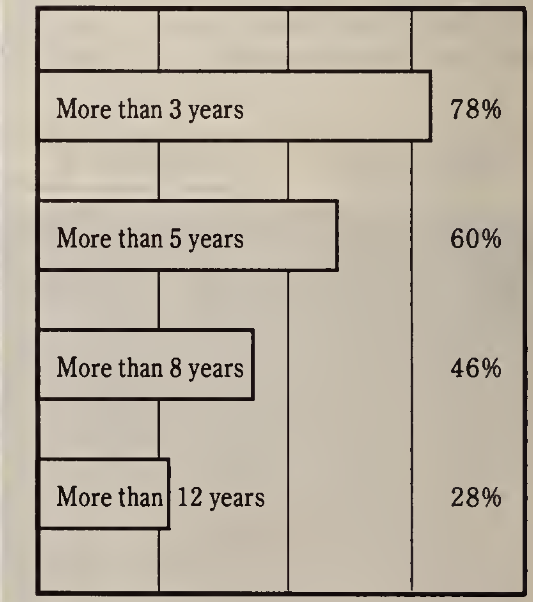

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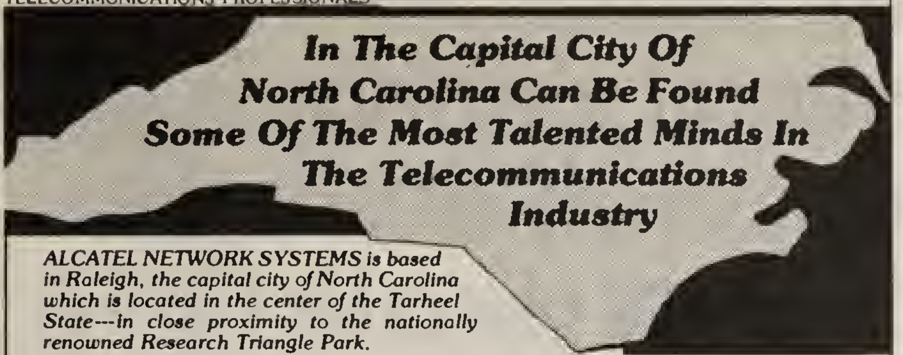
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ALCATEL NETWORK SYSTEMS is based in Raleigh, the capital city of North Carolina which is located in the center of the Tarheel State---in close proximity to the nationally renowned Research Triangle Park.

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Requires 5 or more years experience in software development for transmission products. Knowledge of object oriented design, structured design methodology, STP/CADRE, MTOS, UNIX, C, datacom protocols, network management, OSS interfaces, real-time systems. Skills in team leadership, configuration control and project management required. BS/MS Degree in Computer Science or equivalent.

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For design of real-time embedded microprocessor based software for fiber-optics based telecommunications products. Two years experience in design and implementation of software modules and integration of software with target hardware environment. Knowledge of telephony, C under UNIX or VAX/VMS preferred. Use of emulators and real-time software analyzers a plus. BS/MS Degree in Computer Science or equivalent.

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Your three or more years experience along with knowledge of COBOL, JCL, VSAM, and CICS can open the door to a challenging and professionally rewarding career with us. A BS/CS Degree or equivalent is required. Experience with American Software packages or other manufacturing MRP-II applications, is preferred.

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Systems Programmer with strong analytical skills to be responsible for network hardware and software. Candidate will also participate in the support of system software such as MVS/XA and CICS running on an IBM ES/9000 system. Three years experience in systems programming required. CICS application programming or network control experience a plus. BSCS degree.

Salaries are very competitive, benefits comprehensive and relocation assistance will be provided. Qualified professionals are invited to forward a detailed resume, including salary history and requirements, in strict confidence to: **Staffing, Department BC. ALCATEL NETWORK SYSTEMS, 2912 Wake Forest Road, Raleigh, North Carolina 27609.** An Equal Opportunity Employer M/F/H/V.

ALCATEL
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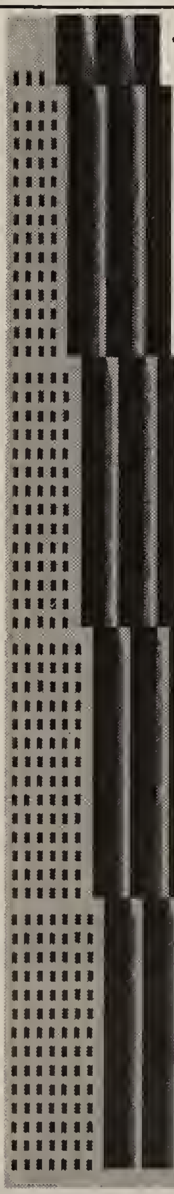

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Baltimore County, MD is seeking a Project Team Leader to oversee the performance and further development of their HRIS and associated systems. Experience with McCormack and Dodge Human Resources and Millennium systems is preferred. Experience with MVS, COBOL, CICS, JCL, VSAM and systems analysis is also preferred. Position requires a bachelors degree including coursework in data processing or business, plus six years' experience in data processing including three years in programming or systems development. Call (410) 887-3135 or (410) 887-JOBS by February 7, 1992 to request an application form, or visit the Office of Personnel, 308 Allegheny Avenue, Towson, MD 21204. EOE

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Major Software Developer seeking outstanding candidate with the following qualifications,

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■ Data Base Administrator

Responsible for designing, controlling, and maintaining the content and structure of corporate data bases in an IBM MVS/ESA environment, and providing technical support and guidance in the migration from current IMS/DB environment. The successful candidate will have a Computer Science degree, or equivalent, five years' experience in systems and programming, and a demonstrated, in-depth knowledge of relational database software and technologies. Three years' direct experience in relational data base design, administration, and support, including utilities, auditing, and recovery tools is required; knowledge of DB/2, Systems Development Life Cycle, application design standards, and CASE methodologies desirable. **Please respond to Job Code SB 131.**

■ Information Services Help Desk Coordinator

Duties include receiving, logging, and responding to calls received at the Help Desk regarding Data Center operations problems, maintaining PC-based problem tracking system, and monitoring production systems for availability and response levels. As this position is the first point of contact for inquiries from users requesting data center assistance, good communications and problem-solving skills are essential. Knowledge of IBM/MVS operational environment required; AS/400 experience a plus. **Please respond to Job Code SB 132.**

■ Ciba Corning offers a competitive salary and benefits package which reflects our corporate commitment to the quality of life as well as work. For confidential consideration, please send resume to the appropriate Job Code, Human Resources Department, Ciba Corning Diagnostics Corp., 63 North Street, Medfield, MA 02052.

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Ciba Corning is an Equal Opportunity/Affirmative Action Employer, M/F/H/V.

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DIRECTOR OF INFORMATION SERVICES

Government agency in Albany, N.Y. seeks applicants for a Director of Information Services. Environment includes multiple IBM data centers and large teleprocessing network. Must have ten years of progressive IS management experience in a mainframe environment. Operational experience is essential; knowledge of client/server technology and office automation is desired. Send resumes by February 28, 1992 with salary history and requirements to:

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"...Our statistics indicate that recruitment advertising in Computerworld attracts more qualified and placeable CASE candidates than any other source."

- Kurt Wilkinson
Vice President,
Advanced Technology Practice
Halbrecht & Company, Inc.

True to its motto, "Your Competitive Edge...Is People," Halbrecht & Company is well on its way to claiming top spot as America's leading CASE recruitment firm. With almost 20 years in the business and offices in Fairfax, VA, Old Greenwich, CT, and New York, NY, the firm provides national search and recruiting services on a contingency, and executive search basis. For Kurt "CASE" Wilkinson, Vice President, Advanced Technology Practice, recruitment advertising in *Computerworld* fulfills a two-fold purpose: generating quality resumes and maintaining its premier image among clients.

"Because of our expertise in leading-edge technologies, our clients look to us as management consultants rather than simply recruiters. So it's crucial that we focus on senior-level CASE tool and methodology professionals with strong I/S backgrounds. Our clients, including Fortune 500 companies, CASE tool vendors, and large consulting firms, typically have requirements for information engineers, senior consultants, data modelers, and I/S planners. Our recruitment advertising in *Computerworld* has positioned us as America's leading CASE recruiting firm.

"We consistently get up to 40 responses for every *Computerworld* recruitment advertisement we run. Since June 1988 we've placed over 70 I/S professionals in CASE positions, and a significant percentage have been direct placements from our *Computerworld* advertising. In fact, our statistics indicate that recruitment advertising in *Computerworld* attracts more qualified and placeable CASE candidates than any other source.

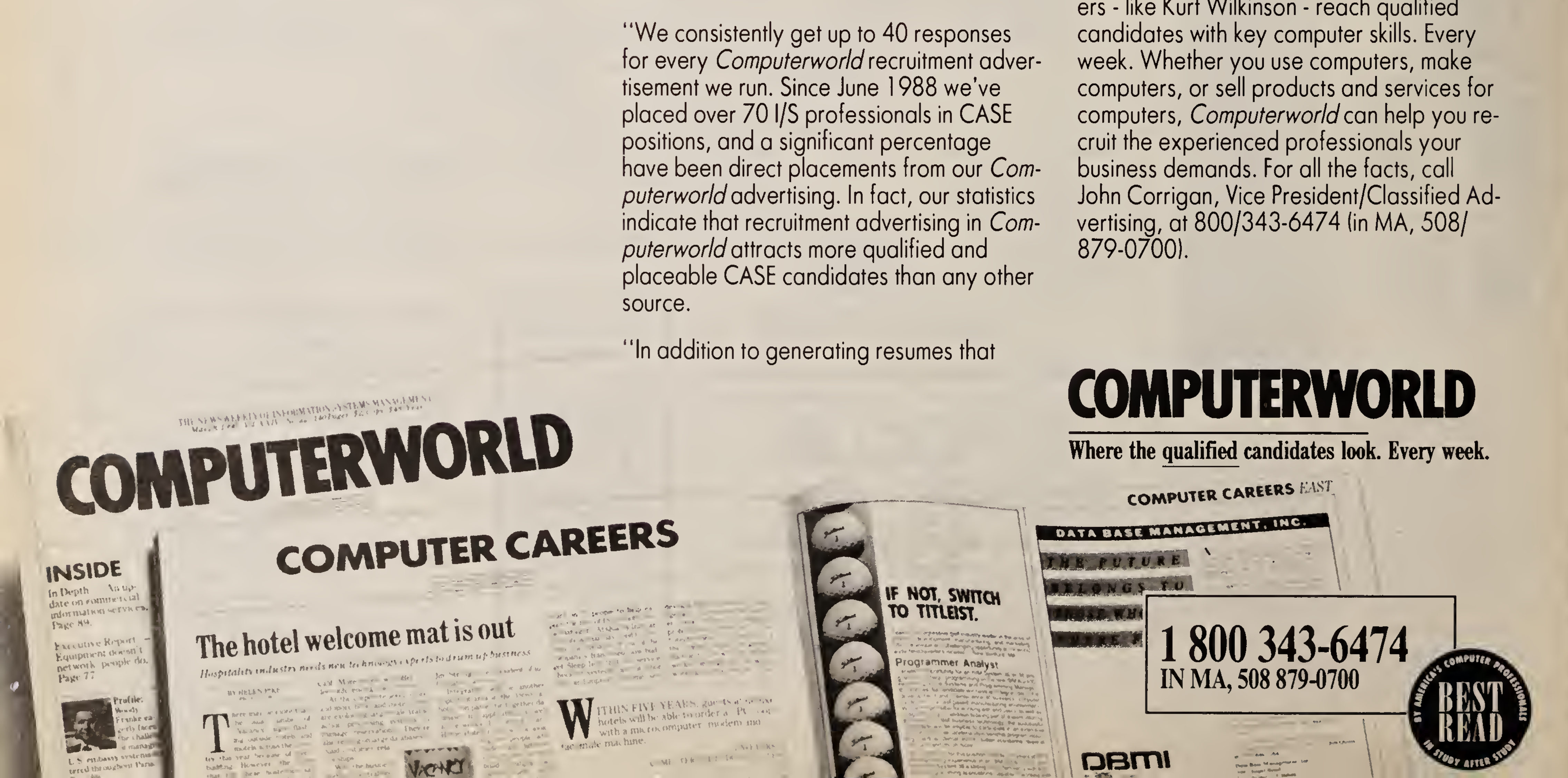
"In addition to generating resumes that closely match job specifications, we also get other valuable benefits from our *Computerworld* recruitment advertising. For example, the advertisement we ran prior to attending CASE WORLD in Chicago opened new doors with contacts that I otherwise would not have made at the show. Also, ongoing contacts we establish at companies, as well as referrals from vendors who recognize our name, help us secure future placements and even acquire new clients. Dollar for dollar, our national recruitment advertising in *Computerworld* is significantly more effective than classified advertising in local newspapers.

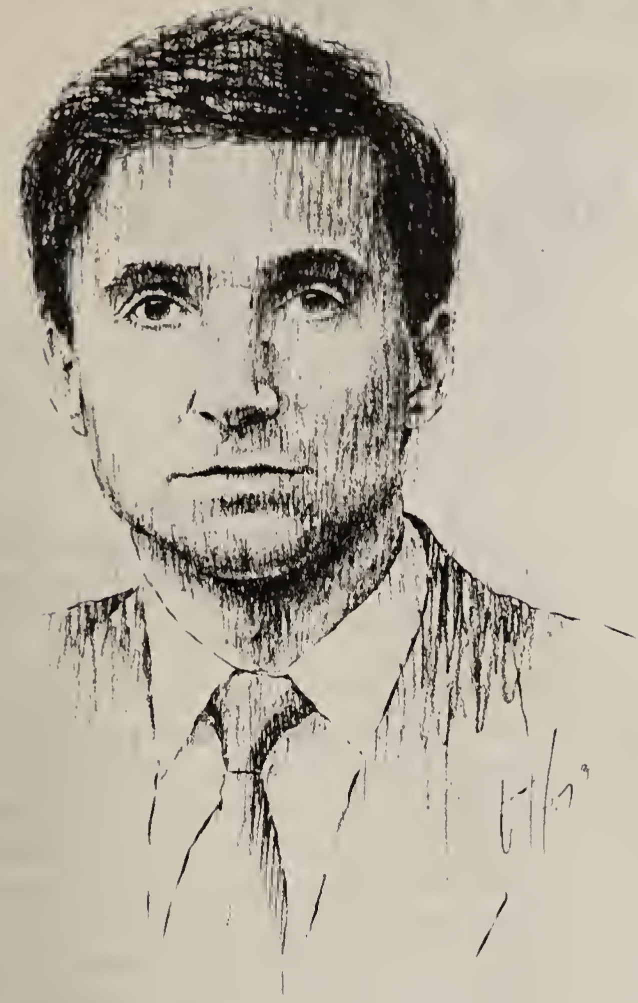
"Right now I believe we are strategically positioned to facilitate the hiring cycle for candidates and clients, whether they are vendors, consulting types or end-users. This market is still in its infancy, with the major growth period still ahead in the 90's. Our greatest challenge is maintaining a competitive edge. As we continue marketing long-term, Halbrecht & Company is dedicated to strengthening its market focus and positioning through its highly successful recruitment advertising program in *Computerworld*."

Computerworld. It's where serious employers - like Kurt Wilkinson - reach qualified candidates with key computer skills. Every week. Whether you use computers, make computers, or sell products and services for computers, *Computerworld* can help you recruit the experienced professionals your business demands. For all the facts, call John Corrigan, Vice President/Classified Advertising, at 800/343-6474 (in MA, 508/879-0700).

COMPUTERWORLD

Where the qualified candidates look. Every week.





"...Computerworld Direct Response Cards help us focus on the people most likely to purchase..."

-Alec Gindis
President
Spectrum Concepts, Inc.

Spectrum Concepts, Inc. has grown over the past decade from a New York City based software consulting firm, to a leading supplier of communications software solutions worldwide. Its XCOM 6.2 software product set new standards for the industry when introducted in 1987, and continues to lead the way in LU 6.2 connectivity.

According to founder and president Alec Gindis, XCOM 6.2 provides off-the-shelf LU 6.2 communications among the industry's widest range of platforms -- mainframes, minis, and PCs -- from such manufacturers as IBM, DEC, Data General, Sun, Stratus, Apple, and others.

"Rapidly increasing sales have shown us that both large and small organizations can benefit from our communications expertise. We offer them far-reaching solutions for applications like file transfer, task sharing, software distribution, transaction processing, automated backup, and more. Efficiently reaching prospects who have these needs has been essential to our growth.

"We value the way *Computerworld Direct Response Cards* help us focus on the people most likely to purchase our products: those with advanced, multi-platform data transfer needs. The cards give us the broadest reach to all the major players in the information systems industry.

"And *Computerworld Direct Response Cards* consistently have provided the lowest cost per lead of any of the media we've used. In fact, we receive hundreds of high-quality leads from every card we run. With very measurable results, *Computerworld Direct Response Cards* provide substantial lead generation for direct use by our sales force.

"Unlike many other cards, *Computerworld Direct Response Cards* also offer the opportunity to do 'split testing.' They allow us to test alternative marketing strategies scientifically, or validate approaches we already use."

Computerworld Direct Response Cards give you a cost-effective way to reach Computerworld's powerful buying audience of over 135,000 computer professionals. Every month. They're working for Spectrum Concepts, Inc. -- and they can work for you. Call Norma Tamburrino, National Account Manager, Computerworld Direct Response Card, at 201/587-0090 to reserve your space today.

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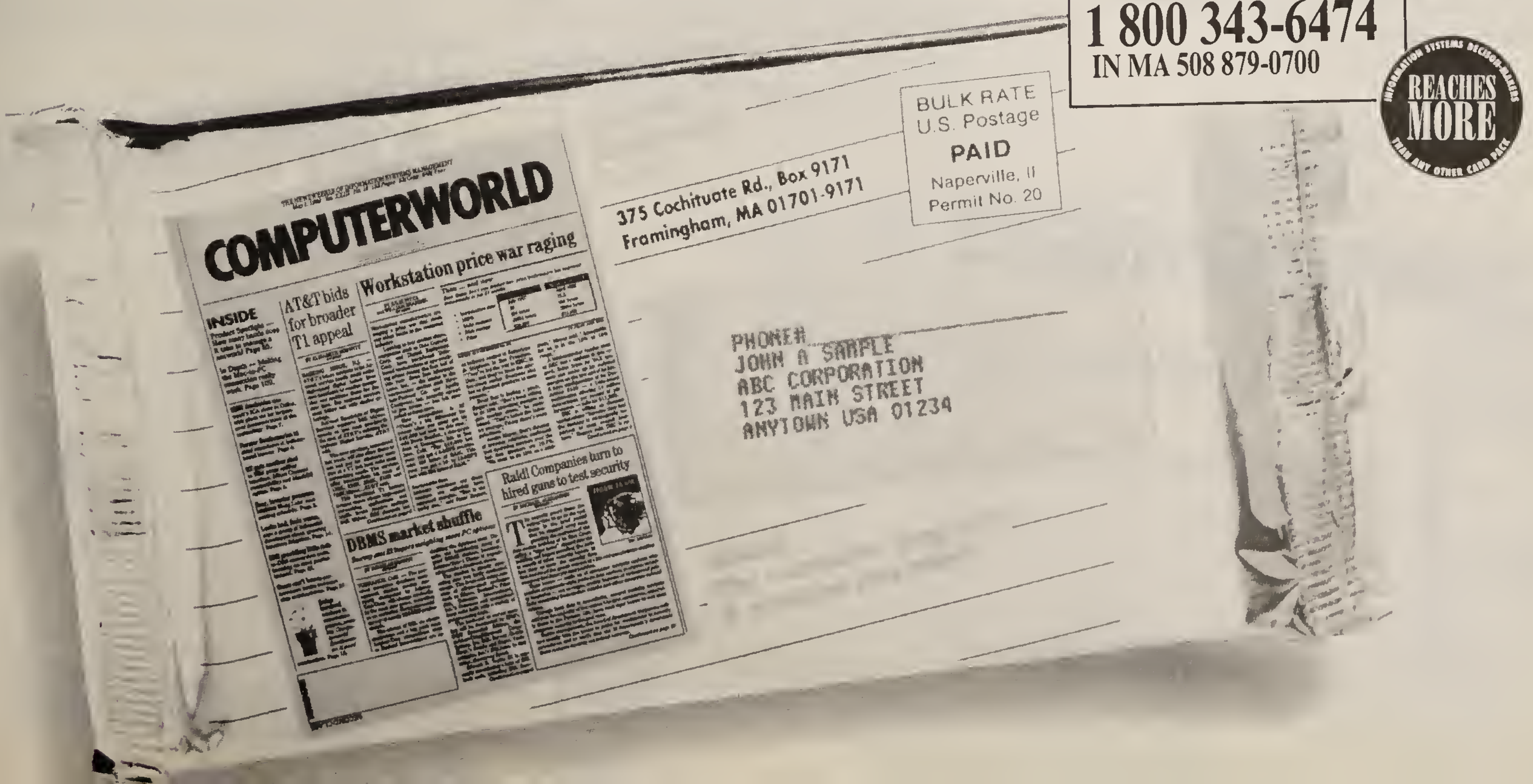
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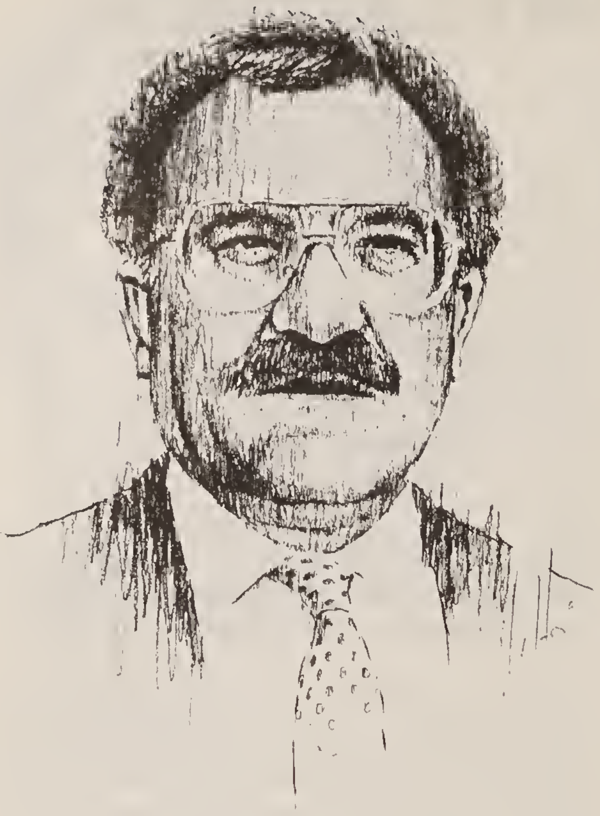

"After running our recruitment advertisement successive weeks in Computerworld, I found we didn't have to advertise anywhere else."

- Bob Monastero
Manager of Human Resources,
Information Management
Xerox Corporation

Calling itself "The Document Company," Xerox Corporation provides copiers, fax machines, printers, and systems products to organizations of all sizes, from single-person businesses to multi-billion dollar companies. With 100,000 employees located in virtually every country worldwide, the company's domestic operations encompass district offices in 65 U.S. cities and 65,000 employees nationwide. At Xerox divisional headquarters in Rochester, NY, hiring up to 50 systems professionals annually is the responsibility of Bob Monastero, Manager of Human Resources, Information Management.

"In information management, our charter is to develop systems that support the strategic business requirements of each and every client function. Because Xerox offers such a diverse product line, our customers and prospective customers represent every industry imaginable. My job, then, is to recruit for a wide range of systems positions. Specifically, I must find qualified professionals with 3+ years of experience as applications developers, technical systems strategists, senior project managers, and information engineers, as well as specialists in areas like artificial intelligence, knowledge-based systems, and information engineering. With *Computerworld*, we attract more candidates with the exact credentials we've defined - and by a wide margin.

"Our recruitment advertising program in *Computerworld* actually began in 1990 with one trial advertisement. I was looking for a systems professional with a very specialized skill set. When an advertisement we placed in the Sunday edition of a major metropolitan newspaper uncovered only one likely candidate, I knew I had to find a more effective vehicle. The same advertisement run in other newspapers produced equally lackluster results. That's when I decided to try *Computerworld*.

"Response from our very first *Computerworld* advertisement was exponentially better in terms of candidate qualifications matching our particular requirements. Even in this very narrow search, the 200 resumes we received yielded a dozen or so candidates with the specific qualifications we needed. In typical situations where I'm looking to fill more generic systems positions, *Computerworld* delivers even more responses and a greater number of qualified candidates. After running our recruitment advertisement successive weeks in *Computerworld*, I found we didn't have to advertise anywhere else.

"With its appropriate environment and breadth of readership, *Computerworld* cost-effectively generates a wealth of highly qualified candidates - advertisement after advertisement. That's why, one year after our trial recruitment advertisement, we're still advertising in *Computerworld*. In fact, based on our tremendous success, we're doubling our 1991 recruitment advertising schedule in *Computerworld*.

Computerworld. It's where serious employers - like Bob Monastero - reach qualified candidates with key computer skills. Every week. Whether you use computers, make computers, or sell computer products and services, *Computerworld* can help you recruit the experienced professionals your business demands. For all the facts, call John Corrigan, Vice-President/Classified Advertising, at 800/343-6474 (in MA, 508/879-0700).

COMPUTERWORLD

Where the qualified candidates look. Every week.

"...The largest percent of our advertising-generated leads come from one source - Computerworld's Marketplace Pages."

- Don Seiden
President
Computer Reserves, Inc.

In business since 1968, Computer Reserves, Inc. of Pine Brook, NJ, is the leading nationwide locator of computing services. According to President Don Seiden, the company acts as a broker of computer services, representing hundreds of data centers throughout the U.S. which have virtually every combination of hardware, software, and peripheral services to sell. Whether it's called remote computing, timesharing, or outsourcing, their mission is to help potential buyers locate data centers that best meet their exacting mainframe specifications in the areas of overflow, backup, disaster recovery, production, and software development.

"Our customer base includes just about everything from A to Z - small start-ups, government agencies, the Fortune 100, Big Six accounting firms, software developers, and manufacturing companies. Trying to reach every potential user of our services is where *Computerworld's* breadth and depth of coverage really pays off. I see *Computerworld's Marketplace Pages* being read by an excellent cross section of professionals - both decision makers and doers - who are in a position to use our services.

"For 10+ years, no other classified advertising vehicle, and we've tried them all, has been as fruitful as *Computerworld's Marketplace Pages* in delivering results. In fact, Computer Reserves is the oldest continuous advertiser in the Time/Services section because it's keyed directly to our business.

"Based on our volume of leads, we know that buyers who can use our services read *Computerworld's Marketplace Pages*. Since we carefully track every lead, it's clear that the largest percent of our advertising-generated leads come from one source - *Computerworld's Marketplace Pages*. And, with company placements and profits having grown tenfold since the mid-1980's, it's fair to say that a substantial number of these quality leads typically become productive business. As an extra benefit, *Computerworld's Marketplace Pages* have brought us many of our best service providers as well.

"I'm a firm believer in the value of advertising continuity, especially when there's an immediate need and high demand for value-added services like ours. I also believe that advertising should be commensurate with growth. Having orchestrated four major outsourcing placements in just 18 months, we need to maximize our exposure in the computing services marketplace. That's why Computer Reserves is now running in *Computerworld's Marketplace Pages* - our tried-and-true advertising platform - every week."

Computerworld's Marketplace Pages. It's where computer buyers meet computer sellers - every week. Sellers and buyers such as Computer Reserves, Inc. who advertise in *Computerworld's Marketplace Pages*, reach over 629,000 information systems professionals, and get results. To put your classified sales message into the hands of America's most influential buyers, call John Corrigan, Vice President/Classified Advertising, at 800/343-6474 (in MA, 508/879-0700).

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Where computer buyers meet computer sellers. Every week.

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Outsourcing... When Time, Capital And Quality Count
VAX SERVICES

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StorageTek, ideally located between Boulder and Denver, Colorado, is a world leader in the design and manufacture of high-performance, large-scale, computer peripherals. We recently announced the development of six new tape products, including three new robotic tape libraries in both the high and low ends of the tape library market. These new generation products will secure our future for years to come, creating excellent opportunities for experienced software engineering professionals who are seeking greater challenges, more stability, and a refreshing change in lifestyle.

Engineering Managers

You will be responsible for a department which debugs and repairs currently released code, and participate in specification, analysis, design, code and test of host software products. Requires a BS/MS or equivalent with 10+ years experience managing software teams with MVS, VM and UNIX operating systems.

Software Engineers

- You will participate in the architecture design and development of on-line DASD-related software. Requires a BS/MS degree or equivalent with 8+ years experience with MVS, VM internals with some networking background preferred.
- You will be involved in the architecture design and development of library-related host software for the StorageTek 4400 family of products. Requires a BS degree or equivalent with 5+ years experience, a working knowledge of IBM Assembler (BAL) and familiarity with MVS/VM internals, UNIX and other operating systems.
- Participate in the design, development and execution of software test programs and procedures; and apply knowledge of MVS/VM systems to test StorageTek's software products. Requires a BS degree or equivalent with 5+ years experience with MVS, VM, UNIX, Relational DBMS, LU 6.2, C, structured test and development methodologies, and test automation.

StorageTek offers a competitive salary and comprehensive benefits package, including relocation assistance. Please send your resume to: **Storage Technology Corporation, Department CW238/DBQ, 2270 S. 88th St., Louisville, Colorado 80028-3159 or FAX to (303) 673-5629.** We are an equal opportunity employer. **No agencies please.**

StorageTek.

The Information Storage
and Retrieval Company.

Data Processing

Only highly technical minds will appreciate this ad.

As a Senior Technical Training Analyst for Federal Express, you will provide technical training support in the analysis, development, delivery and evaluation of courseware for data processing professionals of the Information and Telecommunications Division in Memphis, TN.

Senior Technical Training Analyst

To qualify for this position, you must have a Bachelor's degree/equivalent; 6 years experience in software development which includes 2 years technical training experience in the analysis, development and delivery of software technical training for data processing professionals; knowledge of a wide variety of data processing training resources; the ability to perform as a "Technical Lead" on major training development projects; and strong human relations and communications skills. Experience in IMS COBOL, DB2 and/or C preferred.

We offer an excellent salary commensurate with experience and a comprehensive benefits package. To apply for this career opportunity, please send your resume, to: **Federal Express Corporation, ITD Training, 3865 Airways, Module F, Memphis, TN 38116-8510.**

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ASSOCIATE INFORMATION TECHNOLOGY. Design and Implement sophisticated information technology systems for clients of an international public accounting, tax services and management consulting company. Using financial principles and concepts and techniques of expert systems, decision support systems and information management systems design, development and implementation, direct clients in identification, development and implementation of new technology opportunities and applications. Using FoxBase Plus, FoxPro and Clipper, develop in-house tools to document current systems. Using relational database architecture, design and develop tools to convert Assembler, PL1 and COBOL systems to COBOLII on CASE platform for forward engineering. Using SUMMIT-S and -D, develop and implement new information technology systems, applications and modifications. Minimum requirements: M.S. in MIS. Undergraduate degree must be in Accounting and Finance. Must have one year experience in the position offered or one year experience as a Computer Systems Consultant. Must have completed one course in each of the following: 1) Expert Systems, 2) Information Systems Management, 3) Business Data Communications, 4) Business Systems Analysis & Design, 5) Business System Support Systems. Must have completed one major project in each of the following: 1) design, programming and implementation of a database system using DbaseIII, 2) design and development of an on-line relational database system allowing user access from multiple remote sites. 40 hours per week, 8:00 a.m. to 5:00 p.m., $38,500 per year. "Must have proof of legal authority to work permanently in the U.S." Send resumes to: Illinois Department of Employment Security, 401 S. State Street, 3 South, Chicago, IL 60605, Attn: Joan Sykstus, Reference No: V-IL-4649-S. NO CALLS. AN EMPLOYER PAID AD.

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The following 2 positions are with a U.S. company serving an initial one year, married status assignment in Riyadh.

MVS/ESA Systems Programmer: 10+ years systems programming background, in depth ESA knowledge and broad systems experience

Data Communication Analyst: 5+ years planning, installing, and maintaining an X.25 network in a mixed vendor environment. Must be familiar with hardware and software tools used in IBM network problem determination.

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Northwest electronics company has a position for a Business Systems Analyst. The successful applicant will develop and support with an external vendor an accounting baseline software package consisting of a General Ledger module and an Accounts Payable module suitable for operational use in a multinational environment. Keep current on US and international accounting policies and evaluate the impact of changes on the system. Submit modifications of the system and/or internal accounting procedures related to the system when necessary. Implement the accepted software in various Tektronix subsidiaries. Perform quality control on any modifications. Review and evaluate enhancement requests. Keep current on related application and operating software to ensure compatibility. Minimum Requirements: BA or BS in Business. Three years prior experience as a Business Systems Analyst. Knowledge of EEC Accounting Procedures evidenced by an accounting degree or certificate from a EEC member country. Knowledge of G.A.A.P. (generally accepted accounting principles) as evidenced by an accounting degree. Hours are 8 to 5 Monday through Friday. Base salary: $40,000. Applicants must have legal authority to permanently work in the United States. SEND RESUMES TO: Job Order #5550228, 875 Union St. NE, Salem, OR 97311. An Equal Opportunity Employer.

PROGRAMMER ANALYST (CONSULTANT) - With minimal supervision, provide programming analysis services in project design, development and implementation of communications, financial management information, commercial systems and sophisticated text processing applications. Develop and implement systems interface including systems database and program design, coding and testing enhancements. Develop, write, code and implement new application programs to meet current and projected client needs. Duties entail work with C, ASSEMBLY, LAN, SQL, NetBIOS, Multi-User Database Programming and Systems Development Life Cycle. Must have Master's in Computer Science or Engineering or Math. Experience required is six months in job offered or six months as a Systems Analyst or Computer Administrator. Additionally, experience must involve use of C, ASSEMBLY, LAN, SQL, NetBIOS, Multi-User Database Programming and Systems Development Life Cycle. M-F; 40 hrs/week, 8:00-5:00; salary $30,500/year; Boca Raton, FL location. Must have proof of legal authority to work in the U.S. Send resume to Job Service of Florida, 105 East Broward Blvd., Ft. Lauderdale, FL 33301. Attn: J.O. #FL 0540642. EOE.

Business Programmer to develop & maintain various mainframe & PC based applications to provide crude oil reporting & information support; prepare application program for crude oil loss control including barge analysis, utilizing knowledge of computer programmer languages software packages & mainframe applications; utilize SQL, GWBasic, DOS, Lotus, R:Base & firm pipeline financial systems. Bachelor's degree in Accounting or Computer Science required as well as 2 years experience in job offered or 2 years experience as Associate Accountant and/or Systems Analyst. Must have completed 1 course each in: quantitative analysis of accounting; international business; advanced financial accounting; accounting information systems. Must have proof of legal authority to work permanently in the U.S. 40 hours 8:00am to 4:30pm, $36,400/year. Send resume to Illinois Department of Employment Security, 401 S. State-3 South, Chicago, Illinois 60605, Attn: Mary Millea, Ref. #V-IL-4897-M. No Calls. 2 copies of your resume required. Employer paid ad.

ANALYST/PROGRAMMER
Analysis, design & development of automated & accounting software in a Honeywell Mainframe DPS/8 environment running under GCOS8, utilizing DMIV/TP database software. Require Bachelor's or equivalent (9 months professional experience = 1 year academic) in Systems Analysis or Data Processing & 2 years experience. The 2 years experience must include knowledge & proficiency with Honeywell Mainframe, GCOS8, DMIV/TP, Jackson Structured Methodology or SDM. Salary: $43,000/yr. 40 hrs/wk. Job Location: Hermitage TN. Send resume to Mike Daniel, Job Serv Prog & Tech Supp, TN Dept. of Employment Sec, Nashville, TN 37245-1200. Attention Job Order # TN1235959.

SENIOR COMPUTER SYSTEMS SPECIALIST, 40 hrs/wk, 9am - 5pm. Salary $38,667/yr. Duties: in charge of developing and administering an Ethernet-based Unix Network. Database design; in charge of designing and implementing a distributed relational database system using Unix and DOS computers; programs written in C, SQL and PAL as necessary; modules include Double Data Entry, Data Quality Control, Security and Archiving of Data. Preparation of written specifications and documentation for databases; provide technical support to remote sites; provide technical support for use of network; oversee translation of database questionnaire from English to Spanish. Work to be performed using IBM AT microcomputers or compatible (DOS operating System), SUN SPARCstations (Unix Operating System), Twisted-Pair Ethernet Network, IBM 3090-400 mainframe computer (MTS operating system). Requirements: Bachelor's degree in Computer Engineering, 2 yrs as a Sr System Analyst. Other special requirements include: one course in Operating Systems. Developments of databases. Development of statistical packages. Installation of new Unix releases. Programming in C and FORTRAN. 2 yrs working with Paradox Application Language (PAL). Employer Paid Ad. Resumes to 7310 Woodward Ave., Rm. 415, Detroit, MI 48202. Ref #63391.

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All positions require: bachelor's degree, preferably in computer science or a related field; excellent oral and written communications skills and fluency in English; good organizational skills and ability to work independently.

ASSOCIATE INFORMATION PROCESSING CONSULTANT: Full-time in the Social Sciences Facility microcomputing laboratories (SSML). Provide systems and operations administration and consulting support for SSML. Duties: Operation and maintenance of all lab hardware and software including Novell Netware and IBM PC LAN networks, troubleshooting and maintenance of all lab hardware and software. Requires: 2 years experience with MS/DOS and 1 year experience with Apple Macintosh systems, including systems and application software installation and maintenance: 1 year experience with IBM PC hardware, familiarity with Novell Netware, experience with VAX/VMS, Unix or statistical packages is desirable. Salary range is $25,000 and $31,000.

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For full consideration, submit your letter of application and resume by **February 3, 1992** to: University of Wisconsin-Madison; MACC Personnel Office; include specific name of position applying for, 1210 W. Dayton St; Madison, WI 53706-1685. Application materials may be faxed to 608-262-4679, or submitted electronically to: personnel@macc.wisc.edu. Because of the WI Open Records Law, the following information may not be kept confidential; names, addresses, occupation/title of applicants.

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Education required: Master of Science in Operations Research or Mathematics. Academic course work must include 3 credit hours in: Programming Languages, Data Structures, Algorithms and Complexity.

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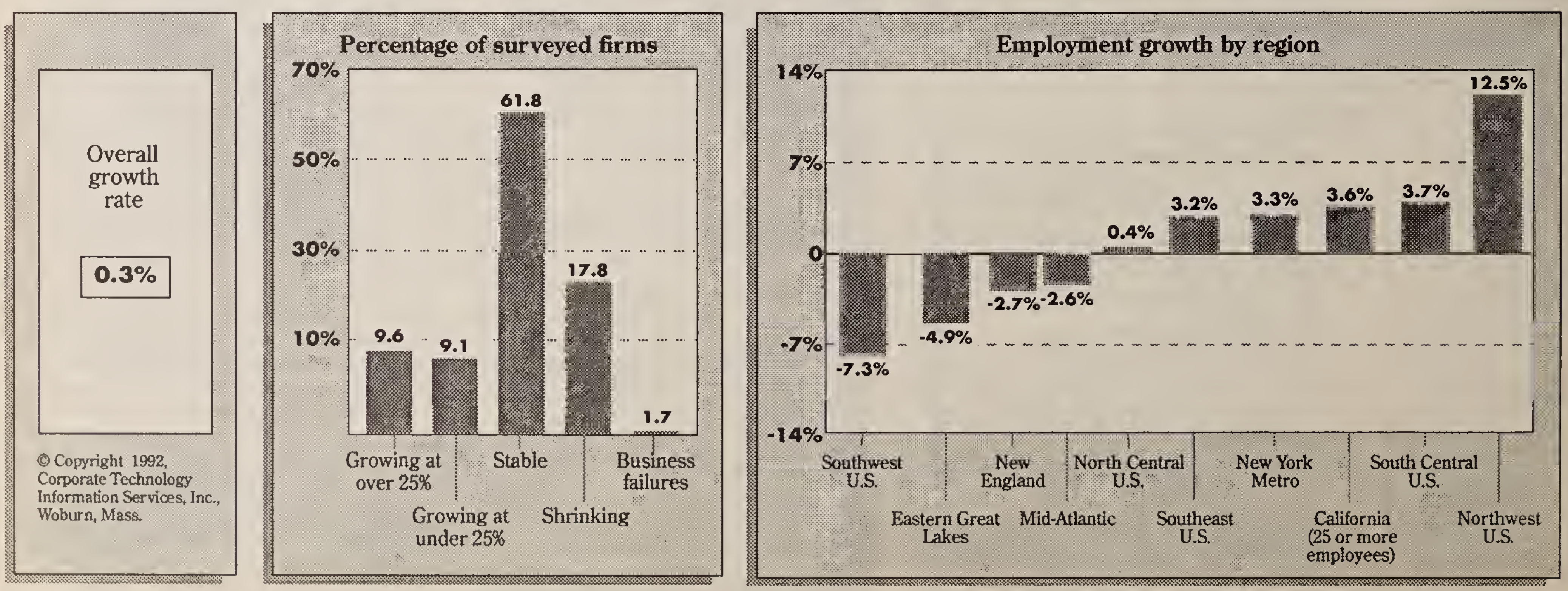

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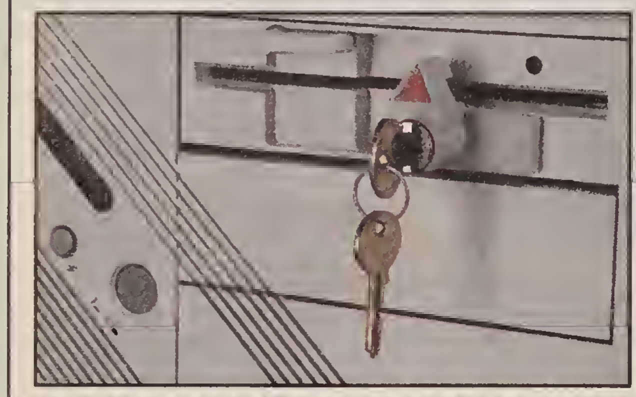

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MARKETPLACE

Antitheft devices for PCs take bite into crime but not budgets

BY ALAN RADDING
SPECIAL TO CW

If a thief is really determined to get his hands on your personal computer, there may not be anything that you can do to stop him. With enough time, cables can be cut, adhesives unstuck and bolts pried off in a variety of ways. Nevertheless, most thieves prefer to avoid that kind of effort if they can, which is why products to deter easy lifting of desktop and portable computers are regarded as smart purchases by many corporations.

Union Carbide Corp. in Danbury, Conn., knows only too well what happens when PCs are left unprotected. Before implementing the simple anchoring device called the Kablit, the company lost as much as $100,000 worth of PCs, says A. E. Jividen, manager of security operations.

However, since the product's implementation five years ago, Jividen reports that not a single piece of equipment has walked away.

Most of the leading products use similiar tactics for deterrence. "Basically, they bolt or cable the computer to the desk and secure it with a lock," explains Tim Garon, new products editor at the Framingham, Mass.-based newsletter, "Information Security Product News."

Anchoring systems run cables that are locked to immovable objects through eyelets attached to the outer case of a PC. Products for IBM and IBM-compatible machines usually use screws or adhesives. Apple Computer, Inc.'s Macintoshes and some of the new notebook computers have removable panels in the back outer case, called security slots, into which a screw with a cable eyelet is inserted.

The Kablit security system from Secure-It, Inc. in East Longmeadow, Mass., is just one of a number of antitheft devices available for PCs and Macintoshes. Other popular devices include the following: the Anchor Pad from Ventura, Calif.-based Anchor Pad International, Inc. secures the computer with a locking pad and adhesive to the desk; the HD 2000 from Fremont, Calif.-based Qualtec Data Products, Inc. bolts the locking pad to the desk; and the Apple Security System from San Mateo, Calif.-based Kensington Microwave Ltd. is a cabling system for the Macintosh.

A product offering a different twist is the PC Screamer from Vantage Point Technologies in San Marcos, Calif. Like a car alarm, a battery-powered alarm inside the CPU goes off at 100db when the computer is moved.

Note Lock by Corporate Management Group, Inc., based in Austin, Texas, is a locking clamp that prevents a laptop from being opened. The clamp attaches to the outside of the case and requires a key. Without it, the laptop must be pried open, ultimately destroying the keyboard. An optional cable is available to keep the laptop from actually being stolen.

Antitheft devices are generally inexpensive, ranging from $30 for a bare-bones cabling system with a thin, shorter cable from Qualtec to almost $200 for Qualtec's HD 2000 or the Anchor Pad, which is the only device that comes with a guarantee to reimburse the buyer for up to $5,000 for a stolen computer secured by it.

Cost, however, is not a big issue with users. "You don't have to lose too many $5,000 computers before you figure you can buy a lot of security devices," says Jividen, who says he buys 500 Kablit systems at a time.

Purchasers are particularly concerned with issues such as whether a device will damage or permanently alter the desk or computer, inhibit necessary movement of a computer or hinder technicians trying to get into the machine to perform service.

Although every vendor strives to address ease-of-use concerns of antitheft devices, there are degrees of difference. For example, to move a computer secured by cabling, the user only needs to unlock the cable, while moving an Anchor Pad requires more effort. That product must be installed by manufacturer-trained personnel, and the pad can only be removed through the application of heat.

Weighing the trade-off

In many cases, a buyer must weigh the trade-off between convenience and degree of deterrence.

Vendors concede there is no fail-safe method to protect a PC, and none make absolute claims that their products will prevent theft entirely. The goal is to make removal hard enough to discourage a thief who wants to move quickly.

Even Anchor Pad, which guarantees its performance, is not fail-safe when at the mercy of a torch or crowbar.

"We've gotten quite a few reimbursement checks from them over the years," says William Lundquist, senior field operations manager and director of security at the Northbrook, Ill.-based Allstate Personal Property and Casualty Co., a division of Allstate Insurance Co.

Union Carbide, on the other hand, liked the ease of installation of a cabling system, which is about a 15-minute effort. The company chose Kablit because each system comes with a lock with a unique master cylinder makeup.

While standard pin locks can be picked easily, higher end systems use locks that are harder to dismantle because of a special internal design.

Radding is a free-lance writer based in Newton, Mass.

Lock 'em up!

Preventing the theft of a computer is only part of the battle. Organizations also want to prevent people from physically gaining access to the data or the inside of the computer. In turn, vendors have responded with a variety of devices that prevent physical entry.

The products below represent a sampling of available locking devices:

- **Key Concepts, Inc.:** Surekey/2, a key-controlled box that plugs into the serial port to activate code, which blocks software access to and from the disk.
- **Kensington Microwave:** Passproof, a floppy disk drive lock for the Macintosh.
- **Corporate Management Group:** Lamalock, a floppy disk drive lock for the IBM Personal System/2 and Caseclosed, a locking enclosure for cable connections.
- **Secure-It:** DLK-270, a series of floppy disk drive locks for the PS/2.
- **Qualtec Data Products:** Unilock locks the CPU chassis and cover for PCs and Macintoshes in order to prevent someone from opening the machines to take internal boards.

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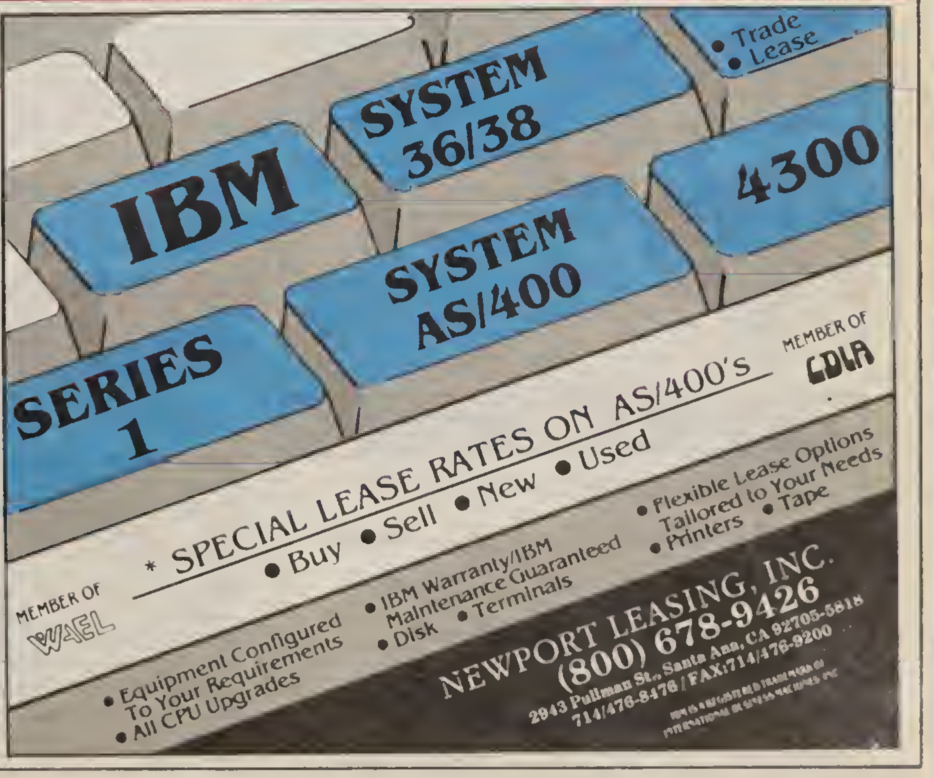

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For immediate sale/lease: Wang VS100; VS5; Removable disks; fixed disk with storage cabinets; laser, band printers & terminals. Package or individual sales considered. Call Deborah Rountree 301-590-7200.

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The BoCoEx index on used computers

Closing prices report for the week ending January 10, 1992

	Closing price	Ask	Bid
IBM XT Model 089	$350	$400	$375
AT Model 099	$500	$525	$475
AT Model 239	$550	$650	$500
AT Model 339	$750	$1,000	$700
PS/2 Model 30 286	$750	$900	$700
PS/2 Model 60	$900	$1,500	$900
PS/2 Model 80	$2,250	$2,600	$2,150
PS/2 Model 90	$4,300	$4,600	$4,100
Compaq Portable II	$400	$500	$375
Portable 286	$900	$1,000	$800
Portable 386	$1,800	$1,900	$1,500
SLT 286	$1,200	$1,300	$1,000
LTE 286	$1,000	$1,300	$900
Deskpro 286E	$850	$1,000	$800
Deskpro 386/20	$2,000	$2,300	$1,900
Apple Macintosh Plus	$700	$750	$650
SE	$975	$1,050	$950
IIX	$3,000	$3,250	$2,800
IICI	$3,700	$3,800	$3,700
IIFX	$4,500	$4,900	$4,400

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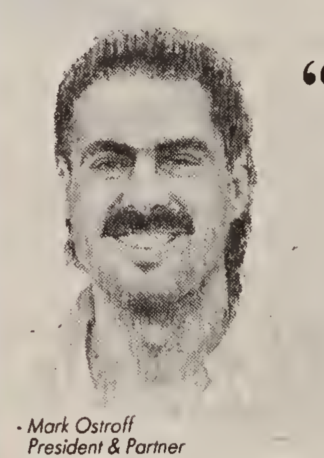

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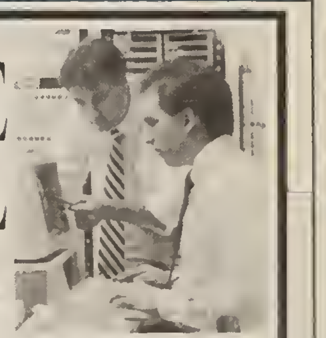

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Watch IBM and Microsoft make history at the Windows & OS/2 Conference.

Microsoft Windows/NT Strategy Briefing

12:30-1:30pm,
Tuesday, January 28

Paul Maritz, VP, Advanced Operating Systems, Microsoft Corp.

Microsoft is moving forward with one graphical user interface and one API: Windows. As new technologies facilitate new functions and features, Microsoft plans to extend Windows in compatible fashion to support these new capabilities, while carrying forward the familiar Windows interface and thousands of Windows applications. Paul Maritz will reveal many of the significant enhancements planned for Windows in 1992, including true 32-bit implementations of Windows and a 32-bit API. Maritz will reveal Microsoft's strategy behind extensions supporting pen-based and multimedia applications, and will detail the services and features that will enable Windows to act as a server platform.

IBM OS/2 Strategy Briefing

12:00-1:15pm,
Thursday, January 30

◂**Lee Reiswig**, Assistant General Manager, Programming Personal Systems, IBM Corp. an
▾**Joe Guglielmi,** General Manager, Marketing & Business Development, Personal Systems, IBM Corp.

IBM's integrating platform for DOS, Windows, and OS/2 applications won ship until March of 1992. But Lee Reiswig (known to his staff as 'Blu Ninja') will lead a guided tour through IBM's most controversial system product, including the Workplace Shell, OS/2's new object-based user interface. Joe Guglielmi will brief you on IBM strategic directions. Come see the 'new' IBM. Q&A afterwards if time permits.

Moderated by:
Sam Whitmore, Editor-in-Chief, *PC Week*
Carole Patton, Editor & Publisher, *ACKnowledge, The Window Letter*

If you're concerned about the future of graphical environments for PC computing, you simply must attend the Microsoft Windows/NT Strategy Briefing and the IBM OS/2 Strategy Briefing at the Windows & OS/2 Conference. The information you can get from just these two sessions could set the course of your company's computing strategies for years to come. Together with the 65-plus Conference sessions, Tutorials and Fast Tracks, and a power-packed exhibition floor, you can see, learn and discover the new world of Windows and OS/2 like never before.

Keynote Address & Panel Session

Tuesday, January 28
8:30-10:00 am

James Burke
Award-Winning Scientific Documentary Film Producer, PBS

1 + 1 = 3

Information surge is the most powerful trigger of innovation and change in human history. How does it operate and how will it structure life in the 21st century?

The Practical Reality

Immediately following and incorporating Mr. Burke's remarks, Tim Bajarin will moderate a panel discussing the impact of multimedia computing on today's information and technology. The panel will be comprised of leading users and industry experts who are implementing existing technologies. Also, the panel will explain how multimedia computing will be brought to the mainstream of society as technology evolves.

Moderator:
Tim Bajarin, Executive Director, Creative Strategies
Panelists:
Howard Elias, Vice President, Tandy Computers,
Richard Landry, Publishing Director, *MPC World*,
Bob Mercurio, Director, Advanced Technology, American Express

Borland Technology Briefing

Wednesday, January 29
12:30 – 1:30 pm

Philippe Kahn
President and CEO, Borland International

Designing software that's easy to use, versatile, and powerful is just one part of the challenge for this decade. Corporate platforms are beginning to require reusable structures and data interoperability. At the same time, Windows developers are demanding a new breed of tools with which to create applications easily and seamlessly. At this briefing, Borland International's President, resident jazz buff, and programmer extraordinaire Philippe Kahn, will brief you on his company's strategic technology direction — object-orientation. Kahn will also detail soon-to-be released Borland products. Moreover, in light of Borland's recent acquisition of dBase mogul Ashton-Tate, Kahn will share his personal insights on evaluating database standards and choosing operating system platforms.

Developers' Keynote: Competing in the '90s

Thursday, January 30
8:30 – 9:30 am

J. Paul Grayson
CEO, Micrografx Corporation

The software market is becoming increasingly top heavy. Th top ten developers account for over 70% of total softwar sales. How can small, medium, and large software companie compete against Microsoft, Borland, and Lotus? The rules c the game have changed. To survive you have got to specialize to create a niche and hold on to it tenaciously. What strategie can you employ to win in the 90s? Can anybody bea Microsoft? And if so, how?

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INDUSTRY ALMANAC

RECOMMENDATION CHANGES

UPGRADED FROM UNDERPERFORM TO HOLD: **Seagate Technology, Inc.** (Shearson Lehman Brothers, Inc.). Improving demand for disk drives means good things for Seagate stock; however, investors should keep in mind the very erratic earnings performance the company has shown in recent years. In addition, Seagate faces potential shareholder lawsuits and a dispute over back taxes: The Internal Revenue Service contends that Seagate owes $113 million. Demand for 3½-in. drives is growing, and the company could turn in better-than-anticipated earnings.

UPGRADED FROM HOLD TO OUTPERFORM: **Quantum Corp.** (Shearson). Like Seagate, Quantum should benefit from the short supply/high demand dynamic hitting the disk drive market right now. Additionally, Apple Computer, Inc., Quantum's largest customer, is upping its orders for the hardware now. Strong new product offerings will contribute to sales and profits in calendar 1992. The company also has no debt.

DOWNGRADED FROM BUY TO NEUTRAL: **Cadence Design Systems, Inc.** (Alex. Brown & Sons, Inc.). The merger with Valid Logic Systems, Inc. is the most critical investment variable driving Cadence's share valuation. This year's earnings are at risk of erosion because of the deal, though the longer term benefits of the merger are significant. For now, Cadence stock is about as high as it is going to go.

1992's TOP PICKS

Needham & Co.

The Ask Cos. should start to show earnings momentum via a combination of improved fundamentals — the Ingres Products Division is adding to the bottom line sooner than expected — and favorable comparisons with the past several weak quarters. Ask is one of the leading providers of manufacturing resource planning software for midrange machines. A new product cycle should begin this year and is expected to include the unveiling of Advance, a workstation-based package.

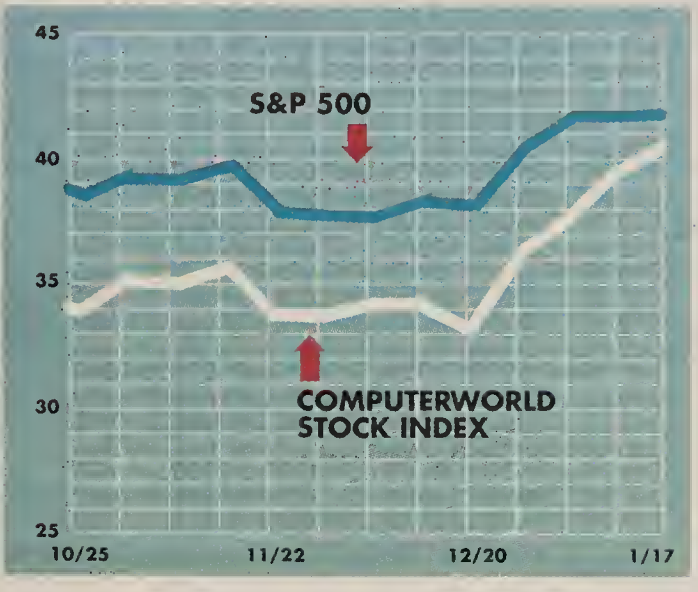
Management has significantly whittled down the bank debt Ask took on to buy out Ingres Corp., which should allow the company to erase that deficit by fiscal year 1993. Meanwhile, Ingres Products Division is starting a big product cycle with the Microsoft Corp. Windows versions of the Ingres fourth-generation language and relational database management system. These two products should be out in all major foreign language versions and on all major hardware platforms early this year.

Bytex Corp. is a big supplier of electronic matrix switches, which provide fault-tolerant connections between wide-area networking equipment and corporate hosts by automatically changing a communications path in the event of a front-end processor failure.

A new product, the Maestro Intelligent Switching Hub, allows users to centrally wire, manage and control the physical layer of Token Ring and Ethernet local-area networks. Competition for Maestro from IBM, Cabletron Systems, Inc. and Synoptics Communications, Inc. is limited, partly because of Maestro's as yet unchallenged ability to let users reconfigure their networks on a port-by-port basis. Bytex has a strong balance sheet with $18.7 million in cash and no debt.

KIM S. NASH

STOCK TRADING INDEX



THIS WEEK'S HIGHLIGHTS

- Huge quarterly losses posted by IBM and Digital Equipment Corp. sent shares of the two big-iron makers reeling. At press time, IBM had gained 5⅝ points for the week to close midday Friday at 96⅞, while DEC sank 3⅜ points to 53⅛.
- Among gainers, shares of Knowledgeware, Inc. jumped 3 points to 19¾ after the company preannounced positive second-quarter financials. Elsewhere, Cray Research, Inc. soared 5⅝ points to 48 after signing a deal that will let DEC resell Cray supercomputers.
- Intel Corp., which reported strong sales and profits for the most recent quarter, rocketed 7½ points to 61 last week. Rival Advanced Micro Devices, Inc. stumbled 1⅛ points to 17¾.
- Sun Microsystems, Inc. skipped ahead 4⅛ points to 33 after rival Hewlett-Packard Co. signed a $400 million reseller deal with Prime Computer, Inc. last week. HP advanced 2¾ to 62¾.

Computerworld Friday Stock Ticker

CLOSING PRICES FRIDAY, JANUARY 17, 1992

TOP PERCENT GAINERS

Tandon Corp.	59.13
Maxtor Corp.	39.62
Data Switch Corp.	35.45
Micrografx	35.21
Software Publishing Corp.	34.38

TOP PERCENT LOSERS

Microcom Inc.	-9.76
Compression Labs Inc.	-8.27
Tektronix Inc.	-7.73
Goal Systems Int'l	-5.77
GTE Corp.	-4.80

TOP DOLLAR GAINERS

Storage Technology	10.00
Intel Corp.	9.75
Motorola Inc.	8.88
Micrografx	6.25
Cray Research Inc.	6.13

TOP DOLLAR LOSERS

Borland Int'l	-3.50
Nynex Corp.	-3.25
Compression Labs Inc.	-2.75
General Motors E (EDS)	-2.75
Digital Equipment Corp.	-2.50

Communications and Network Services — Up 3.67%

Exch	52-Week	Range		Jan. 17 Close	Wk Net Change	Wk Pct Change
OTC	12.88	5.88	3 COM Corp.	12.88	2.13	19.77
NYS	69.75	55.75	American Info Techs Corp.	63.88	-0.50	-0.78
NYS	41.38	30.25	AT&T	40.75	-0.25	-0.61
OTC	4.13	0.88	Artel Communication Corp.	2.88	0.25	9.52
NYS	54.13	43.00	Bell Atlantic Corp.	45.75	-1.00	-2.14
NYS	54.88	45.38	Bellsouth Corp.	50.00	-0.50	-0.99
NYS	58.75	30.25	Cabletron Systems	58.75	3.50	6.33
OTC	35.25	11.00	Compression Labs Inc.	30.50	-2.75	-8.27
OTC	5.13	1.50	Data Switch Corp.	2.63	0.69	35.45
NYS	22.38	12.38	Digital Comm. Assoc.	22.00	2.25	11.39
OTC	25.25	14.00	Dynatech Corp.	20.25	-0.25	-1.22
OTC	12.38	5.00	Fibronix Int'l Inc.	8.88	0.63	7.58
OTC	29.75	8.00	FileNet Corp.	27.75	-0.75	-2.63
OTC	3.75	1.13	Gandalf Technologies Inc.	2.63	0.13	5.00
NYS	3.88	2.13	General Datacomm Inds.	3.50	0.25	7.69
NYS	35.00	27.63	GTE Corp.	32.25	-1.63	-4.80
NYS	63.00	48.50	ITT Corp.	59.25	3.00	5.33
OTC	35.00	19.38	MCI Commmunications Corp.	32.75	-0.75	-2.24
OTC	14.50	3.50	Microcom Inc.	9.25	-1.00	-9.76
NYS	18.00	4.00	Network Equipment Tech.	18.00	1.63	9.92
OTC	19.50	6.75	Network General	19.50	3.63	22.83
OTC	18.88	10.50	Network Systems Corp.	17.38	-0.13	-0.71
NYS	47.75	26.25	Northern Telecom Ltd.	47.75	1.75	3.80
OTC	65.00	18.63	Novell Inc.	61.25	-1.00	-1.61
NYS	82.38	67.00	Nynex Corp.	76.63	-3.25	-4.07
NYS	46.75	38.50	Pacific Telesis Group	41.50	-1.25	-2.92
OTC	11.63	5.63	Penril Data Comm. Ntwks.	9.00	1.25	16.13
OTC	50.75	12.50	PictureTel Corp.	47.00	0.50	1.08
NYS	18.63	11.63	Scientific Atlanta Inc.	17.63	0.25	1.44
NYS	66.00	49.00	Southwestern Bell Corp.	61.75	-1.38	-2.18
NYS	31.50	21.25	United Telecom	25.00	-0.63	-2.44
NYS	40.75	33.75	U S West Inc.	36.88	-0.75	-1.99

Computer Systems — Up 7.35%

Exch	52-Week	Range		Jan. 17 Close	Wk Net Change	Wk Pct Change
OTC	20.75	6.75	Advanced Logic Research	9.25	0.00	0.00
ASE	18.13	11.63	Amdahl Corp.	18.13	1.50	9.02
OTC	73.25	40.25	Apple Computer Inc.	64.75	2.50	4.02
OTC	9.13	2.75	Archive Corp.	5.50	0.75	15.79
OTC	32.75	14.50	AST Research Inc.	22.63	2.38	11.73
NYS	9.38	4.75	Bolt, Beranek & Newman	5.88	0.00	0.00
NYS	21.63	10.13	Commodore Int'l	17.00	0.88	5.43
NYS	74.25	22.13	Compaq Computer Corp.	33.75	2.13	6.72
OTC	2.63	0.50	Computer Automation Inc.	1.44	0.00	0.00
NYS	13.75	7.50	Control Data Corp.	10.63	0.88	8.97
NYS	19.75	8.88	Convex Computer	14.63	0.88	6.36
NYS	52.25	31.50	Cray Research Inc.	48.88	6.13	14.33
NYS	22.50	4.00	Data General Corp.	17.75	1.00	5.97
NYS	4.38	1.00	Datapoint Corp.	2.50	0.00	0.00
OTC	36.25	19.50	Dell Computer Corp.	33.13	2.00	6.43
NYS	83.00	48.50	Digital Equipment Corp.	53.00	-2.50	-4.50
NYS	30.13	19.75	Harris Corp.	30.13	1.75	6.17
NYS	62.00	34.75	Hewlett Packard Co.	62.00	3.50	5.98
NYS	139.75	83.50	IBM	96.75	5.88	6.46
OTC	12.00	6.50	Information Int'l	7.25	0.00	0.00
NYS	145.75	105.00	Matsushita Electronics	110.50	0.25	0.23
OTC	20.88	7.88	MIPS Computer Systems	12.38	1.75	16.47
OTC	29.50	10.75	Pyramid Technology	15.00	1.00	7.14
OTC	19.75	7.50	Sequent Computer Sys.	16.63	2.25	15.65
NYS	52.25	24.25	Silicon Graphics	52.25	4.25	8.85
NYS	51.50	22.00	Stratus Computer Inc.	49.75	0.75	1.53
OTC	38.63	20.75	Sun Microsystems Inc.	34.13	3.25	10.53
NYS	17.63	9.50	Tandem Computers Inc.	12.88	0.13	0.98
OTC	4.75	1.25	Tandon Corp.	2.19	0.81	59.13
NYS	36.50	23.38	Tandy Corp.	26.63	-1.25	-4.48
OTC	32.00	9.75	Teradata	32.00	0.13	0.39
NYS	6.13	1.13	Ultimate Corp.	2.38	0.00	0.00
NYS	7.00	2.13	Unisys Corp.	5.50	0.75	15.79
ASE	5.75	2.00	Wang Labs Inc. (b)	3.13	0.25	8.70

Software & DP Services — Up 6.90%

Exch	52-Week	Range		Jan. 17 Close	Wk Net Change	Wk Pct Change
OTC	68.50	33.75	Adobe Systems Inc.	63.88	3.00	4.93
OTC	12.25	3.50	Aicorp	9.63	0.50	5.48
OTC	59.88	28.75	Aldus Corp.	34.50	1.00	2.99
OTC	28.50	16.25	American Mgmt. Systems	23.50	-1.00	-4 08
OTC	17.50	9.00	American Software Inc.	16.88	0.00	0.00
NYS	4.63	1.88	Anacomp Inc.	4.63	0.63	15.63
OTC	18.25	12.00	Analysts Int'l	16.00	0.50	3.23
OTC	17.25	4.63	ASK Computer Sys.	17.25	2.63	17.95
NYS	46.38	27.50	Auto Data Processing	46.13	1.00	2.22
OTC	62.25	29.50	Autodesk Inc.	39.50	4.50	12.86
OTC	39.25	20.75	BGS Systems Inc.	39.25	1.50	3.97
OTC	75.50	33.00	BMC Software Inc.	75.50	3.88	5.41
OTC	16.25	8.75	Boole & Babbage Inc.	16.25	2.50	18.18
OTC	86.75	37.25	Borland Int'l	75.25	-3.50	-4.44
OTC	20.88	7.50	Cognos Inc.	12.25	1.38	12.64
NYS	12.88	7.25	Computer Associates	12.50	0.88	7.53
OTC	17.75	7.75	Computer Horizons	11.50	-0.25	-2.13
NYS	80.88	47.75	Computer Sciences	80.63	1.63	2.06
NYS	11.25	7.00	Computer Task Group	9.00	0.25	2.86
OTC	22.75	12.00	Comshare Inc.	19.00	2.50	15.15
OTC	16.50	6.00	Corporate Software	14.75	0.75	5.36
NYS	66.13	39.25	General Motors E (EDS)	60.38	-2.75	-4.36
OTC	18.75	9.25	Goal Systems Int'l	12.25	-0.75	-5.77
OTC	7.00	2.25	Hogan Systems Inc.	6.50	1.13	20.93
OTC	33.00	10.50	Information Resources	33.00	3.00	10.00
OTC	23.38	2.63	Informix Corp.	23.38	5.63	31.69
OTC	3.63	1.06	Intellicorp Inc.	1.50	0.06	4.31
OTC	31.50	14.50	Intergraph	21.50	1.25	6.17
OTC	10.50	3.13	Interleaf Inc.	10.38	0.38	3.75
OTC	18.75	7.00	Intersolv	18.75	1.25	7.14
OTC	43.25	10.50	Knowledgeware Inc.	19.75	2.75	16.18
OTC	45.00	20.25	Legent Corp.	41.00	1.50	3.80
OTC	40.75	14.75	Lotus Development	31.75	3.63	12.89
OTC	19.00	11.50	Mentor Graphics	17.25	1.00	6.15
OTC	32.00	9.75	Micrografx	24.00	6.25	35.21
OTC	129.00	56.50	Microsoft Corp.	126.50	1.25	1.00
OTC	18.13	5.50	Oracle Systems	18.00	0.25	1.41
OTC	10.00	3.56	Phoenix Technologies	8.38	0.88	11.67
OTC	25.25	9.00	Platinum Technology	23.25	-1.00	-4.12
NYS	72.75	42.25	Policy Management Sys.	69.38	0.63	0.91
NYS	37.38	16.13	Reynolds & Reynolds	35.63	-1.13	-3.06
OTC	15.50	6.75	Ross Systems	15.50	1.63	11.71
OTC	30.75	18.00	SEI Corp.	30.75	5.00	19.42
OTC	24.13	14.63	Shared Medical Systems	22.25	0.38	1.71
OTC	35.25	12.50	Software Publishing Corp.	21.50	5.50	34.38
NYS	24.88	7.50	Sterling Software	22.50	0.75	3.45
OTC	21.00	10.25	Sungard Data Sys.	19.25	0.00	0.00
OTC	50.00	16.38	Symantec Corp.	50.00	2.50	5.26
NYS	15.50	4.63	System Center Inc.	12.88	-0.13	-0.96
OTC	26.00	8.34	System Software Assoc.	26.00	1.75	7.22

Semiconductors — Up 8.35%

Exch	52-Week	Range		Jan. 17 Close	Wk Net Change	Wk Pct Change
NYS	20.50	5.38	Advanced Micro Devices	18.75	-0.50	-2.60
NYS	12.50	7.00	Analog Devices Inc.	10.38	0.63	6.41
OTC	13.50	7.00	Chips & Technologies	10.25	-0.13	-1.20
OTC	62.50	38.50	Intel Corp.	62.50	9.75	18.48
NYS	12.50	6.25	LSI Logic Corp.	9.63	0.38	4.05
NYS	19.13	10.63	Micron Technology	17.25	1.13	6.98
NYS	79.88	46.88	Motorola Inc.	79.88	8.88	12.50
NYS	8.50	3.88	National Semiconductor	8.50	0.75	9.68
NYS	47.63	26.00	Texas Instruments	35.25	2.63	8.05
OTC	12.25	5.88	VLSI Technology	9.13	0.13	1.39
OTC	16.75	4.50	Weitek	6.38	0.50	8.51
ASE	6.75	2.00	Western Digital Corp.	4.00	0.88	28.00

Peripherals & Subsystems — Up 9.09%

Exch	52-Week	Range		Jan. 17 Close	Wk Net Change	Wk Pct Change
OTC	2.75	1.00	Apertus Technologies	1.25	0.00	0.00
OTC	19.50	7.75	Banctec Inc.	18.75	0.25	1.35
OTC	40.50	7.88	Cambex Corp.	40.00	4.38	12.28
ASE	11.75	6.50	Cognitronics Corp.	10.13	0.50	5.19
NYS	29.75	12.50	Conner Peripherals	20.63	3.00	17.02
ASE	21.75	8.25	Dataram Corp.	21.75	1.13	5.45
NYS	14.13	4.88	EMC Corp.	14.13	1.50	11.88
NYS	49.75	38.63	Eastman Kodak Co.	48.88	0.75	1.56
OTC	11.25	4.75	Emulex Corp.	6.50	0.63	10.64
OTC	24.00	14.75	Evans & Sutherland	20.00	0.25	1.27
OTC	10.00	4.00	Iomega Corp.	10.00	0.63	6.67
OTC	28.25	14.50	IPL Systems Inc.	23.00	1.00	4.55
OTC	9.25	1.63	Maxtor Corp.	9.25	2.63	39.62
OTC	18.00	5.50	Micropolis Corp.	11.25	0.38	3.45
NYS	98.13	79.75	3M Corp	98.13	3.25	3.43
OTC	10.75	3.50	Printronix Inc.	4.25	0.50	13.33
NYS	26.75	11.25	OMS Inc.	14.25	0.75	5.56
OTC	18.25	8.88	Quantum Corp.	15.25	1.75	12.96
NYS	10.63	5.00	Recognition Equipment	10.63	0.50	4.94
OTC	11.50	5.38	Rexon Inc.	10 13	1 88	22.73
OTC	19.88	7.13	Seagate Technology	13.63	2.75	25.29
NYS	61.50	21.88	Storage Technology	61.50	10.00	19.42
NYS	30.88	16.00	Tektronix Inc.	20.88	-1.75	-7.73
OTC	0.53	0.16	Televideo Systems	0 31	0.03	11.39
NYS	70.88	41.38	Xerox Corp.	70.88	2.75	4 04

Leasing Companies — Up 1.69%

Exch	52-Week	Range		Jan. 17 Close	Wk Net Change	Wk Pct Change
OTC	16.25	8.25	Amplicon Inc.	14 25	0.00	0.00
NYS	28.38	18.13	Comdisco Inc.	22.88	0 38	1.67
OTC	16.25	10.25	LDI Corporation	15.50	0.75	5.08

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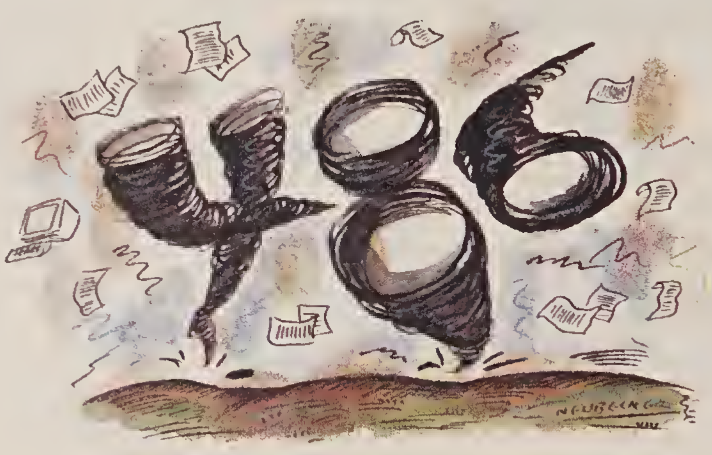
I486: A new deal for desktops

CONTINUED FROM PAGE 1

a similar decline in price in one year.

As relentless industry competition drags 386 personal computer prices painfully close to the margin's edge and into the commodity market, the 486 has started a downward slide as well. Computer Intelligence/Infocorp, a La Jolla, Calif.-based research firm, tracked a 14.6% decrease from August to November 1991 in the median configured price for 486DX machines. CI/Infocorp attributed the slide to direct marketers, such as Compuadd Corp., Dell Computer Corp. and Advanced Logic Research, Inc., that were able to skim the market earlier in the chip life cycle.


Robert Neubecker

Where users have in many cases given only lip service to the 386 standard — buying these on an as-needed basis while using 286s and even 8088s for the bulk of their PC needs — the 486 may benefit by having firms effectively bypass the 386.

Still, market research firm International Data Corp. projects a healthy demand for the 386, particularly the 386SX, which will remain the cost-cutter's graphical user interface (GUI) platform for the next several years. The company expects 386SX shipments, slated at 2.9 million for 1992, to outsell the expected 2.5 million units shipped for the 486DX.

Those already using the 486 are doing so for specific power needs, such as computer-aided design and manufacturing and other intensive computing environments. But with GUIs becoming more prevalent, 486-based systems have become more attractive because they can run basic software faster.

Meanwhile, companies less prone to hanging 10 on the bleeding edge find themselves examining the 386 platform with renewed interest, particularly in light of the 386 price-cutting going on among PC vendors. Timothy Keating, Intel's product marketing manager for the 386 and 486 microprocessors, predicted that users will see 386-based machines falling below $1,000 on a widespread basis this year.

"We're standardized on the 386, just like everybody else," said Glenn Sandusky, chief information officer at Miller Mason & Dickenson, a benefits consulting firm owned by Aon Corp. While Sandusky said his firm is beginning to examine the 486 and owns a couple of 50-MHz 486s, he does not expect to make the 486 a standard in 1992.

Meanwhile, ever-cheaper 486s highlight the natural decline of the 286 as a business staple. There is almost unanimous agreement that the 286 is nearing the end of its life cycle, although laptop sales and rock-bottom budget buyers will keep units shipped this year at around 3.2 million, according to figures from Workgroup Technologies, Inc. in Hampton, N.H. (see story below).

Despite these sales estimates, many major corporations have already begun the 486 migration.

"Prices are coming down, not only with first-tier PC vendors but with the clones as well. What our managers are faced with here is a capital constraint, so they're looking at clones, which will be 486s, and reduced numbers of first-tier products," said Ben L. Berry, manager of computer services at Hughes Aircraft Co. in Los Angeles.

If prices drop significantly on 486-based models, "I would push real hard to buy 486s," agreed Joseph Trickey, PC coordinator at Stratton-Cheeseman Management Co. in East Lansing, Mich. "I like the flexibility of the 486 platform," he added, referring to its ability to handle more tasks due to its built-in floating-point capabilities.

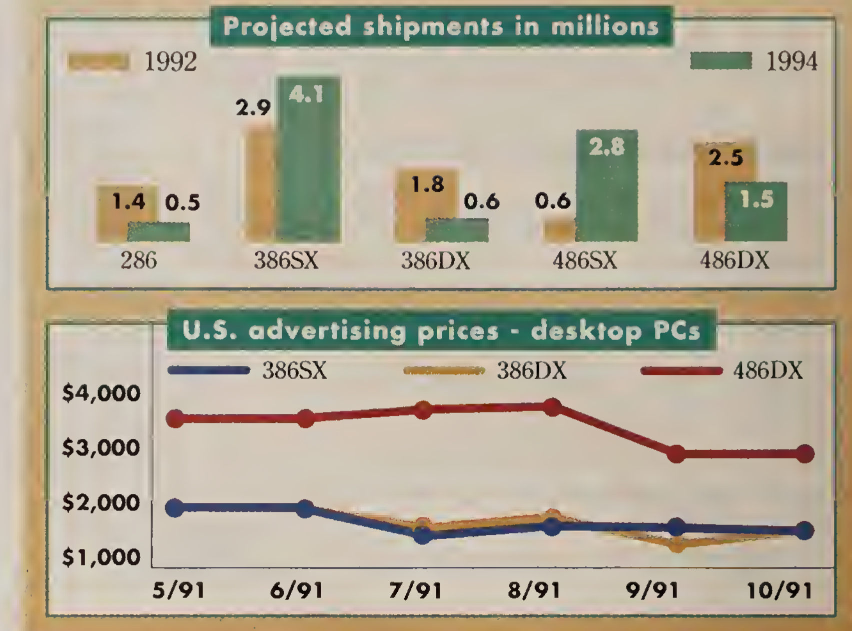
Although price incentives have provided one plank in the 486 standardization rationale, many information systems managers are opting for the higher powered boxes as they plan for software upgrades that will use the chip's speed and 32-bit multitasking capabilities.

Berry said Hughes is also looking to standardize on 486-based machines for future software needs, such as the booming graphical interface market and a 32-bit operating system.

The longevity issue is tantalizing to Anthony Best, a data processing procurement analyst at the Bureau of Data Processing in the state of Mississippi. He said the bureau has bought 550 486s because the state needs to make hardware last twice as long as corporate users do.

Natural selection

While the 386 will remain dominant, for 1992, price cuts are putting a kick in 486 sales



Source: International Data Corp.

CW Chart: Marie Haines

Make room for son of 486

P5 chip expected to arrive by late summer

Don't look now, but Intel's 486 follow-on, the P5, will hit the market late this summer.

Sources close to Intel do not expect to see the chip announced until as late as September, at which time a 50-MHz version of it is likely. At that point, Intel will expand the 586 product line a la the 486 family.

Observers said they agree with Intel's claim that the P5's speed and built-in high availability will make systems based on it true competitors to mainframes and high-end minicomputers. Still, they expect the chip to end its anticipated three-year life cycle as a high-volume processor aimed at the desktop.

In the early part of its life, the P5 will probably draw reactions like the one from Michael Purcell, a staff software engineer at Baxter Healthcare Corp. in McGaw Park, Ill. "[It] holds nothing for me, as far as I can tell. To run decentralized transaction processing, I don't need another chip from Intel," he said.

The P5 will resemble the 486, with on-board cache and internal 64- and 128-bit data transfer paths. It have System Management Mode, Intel's power management strategy, as well as partitionable cache and a so-called superscalar design.

The superscalar part of the chip means it will be able to process two commands at a time (the 486 can handle one command per cycle; the 386, one per two cycles). Intel said this will make it up to twice as fast as the 486 for integer operations. For floating-point operations, most sources think the P5 will run five to seven times as fast as the 486. Intel refused comment.

While many sources said they think the P5 will effectively operate as a multiprocessing processor, Michael Slater, editor of the "Microprocessor Report" in Sebastapol, Calif., said this is a "gross simplification" of the superscalar architecture.

MICHAEL FITZGERALD

There's life in the old 286 chip yet

BY CAROL HILDEBRAND
CW STAFF

Although Intel Corp. 80286-based platforms have long been crossed off corporate purchasing lists and analysts' long-range market forecasts, small businesses and laptop sales will keep the venerable chip out of the dustbin for another year or so.

In fact, despite Intel's autumn 1989 "no 286" campaign — which the company now insists was aimed at explaining product differences rather than killing the 286 — 286 personal computers are selling at a healthy clip.

According to International Data Corp. (IDC), a Framingham, Mass.-based research company, although units shipped annually are falling at a rate of 50% or more, 286 systems sold more heavily in 1990 than did 386SX-based boxes, and 1991 saw balanced sales of the 286 and the 386DX.

Intel's director of marketing, Dennis Zartar, said his company views the 286 as almost out of the loop. Although the company has not stopped production, he said, it is being de-emphasized. "It's hard to find 286s even at the mass merchants," he said.

Although the 286 has ceased to play a factor in new desktop sales to the Fortune 1,000 since early 1991, analysts said, it has gotten a second wind from the home, small business and portable markets, whose users can pick one up for about $800.

"The 386 is now the entry-level machine of choice [for businesses]. Still, a lot of folks out there are turning around and buying a 286," said Jeffery Davidson, controller at Phillips Properties, Inc., a Mcallen, Texas-based petroleum distributor.

Davidson, who runs The Santa Cruz Operation's Xenix-based system from a 486-based server, said he has invested in a number of 286s rather than dumb terminals as a result of PC price cuts. "If you're just going to have a minimum wage clerk doing data entry work, he doesn't need to multitask, or do fancy stuff."

Machines based on the 286 continue to show short-term strength in the laptop field as well. Not only is the 286 cheaper, but it does not require as much energy as the 386 to run.

Richard Zwetchkenbaum, a senior PC analyst at IDC, said that in the notebook market, 286 systems are "being sold at fire-sale prices, but there's still a revenue opportunity out there." He pointed to reports that Zeos International Ltd. withdrew its 286 laptop from the market, only to reintroduce it later on.

At the Fortune 500 level, however, the 286 seems to be headed for a glass case in the computer museum when it comes to new purchases.

"Our company standard is 386 and above, so we would not buy 286s," said Ben L. Berry, manager of computer services at Hughes Aircraft Co. "The 386s aren't that much more money, why go with a 286?"

Tim Bajarin, an analyst at Creative Research Strategies International, Inc. in Santa Clara, Calif., agreed. "The 286 is not significant at all" in the corporate market, he said.

Prime set to resell HP workstations

BY KIM S. NASH
CW STAFF

NATICK, Mass. — Prime Computer, Inc. last week continued its exodus from the hardware business by signing a $400 million deal to resell Hewlett-Packard Co. Unix workstations.

Prime users said they generally approved and that they had more confidence in the troubled vendor's financial position as a result of the new relationship.

"Instead of trying to reinvent the wheel, Prime will sell an existing good wheel. They're better off," said Larry Pratt, former president of the Mid-Atlantic Prime Users Group, which is headquartered in St. Louis.

Existing users, particularly those on high-end Prime 50 Series boxes, "were wondering what would happen to them next, and now they know," said Harvey Allison, an analyst at Alex. Brown & Sons, Inc.

The 3½-year contract calls for Prime and its Computervision subsidiary to resell HP's Precision Architecture (PA) reduced instruction set computing (RISC) servers and workstations [CW, Jan. 13].

Prime will also port its Prime Information development environment to HP 9000 Series 800 servers and move Computervision's CADDS-5 computer-aided design software to HP Apollo Series 700 workstations.

With the Information port slated to ship next month, users of proprietary PrimeOS have a clear Unix migration path, according to Neil McMullan, president of Prime's Computer Systems Business Unit.

No nibbles

However, some users are not biting — at least not now. Pratt said the company will stretch its existing Prime Model 2755 for another year, waiting for Prime software to "stabilize" on the HP machines.

However, when the time comes, an HP server "is definitely in the cards," he said.

McMullan emphasized that Prime "will continue to support the 50 Series for as long as anyone wants it."

Computervision, which already resells Sun Microsystems, Inc.'s workstation, has signed a separate agreement with Digital Equipment Corp. to port CADDS-5 to the Maynard, Mass., firm's RISC machines.

HP's Lou Platt, executive vice president and head of the Computer Systems Group, said he is not worried about the competition. "We'll let our performance speak for itself," he said.

Selling CADDS-5 on three different platforms will not confuse users because most of the overlap is at the high end only, according to analysts. Sun officials were unavailable for comment, but McMullan said the new DEC and HP contracts do not mean Prime will drop Sun.

But analysts said they expected Computervision might push the HP envelope harder than DEC's or Sun's, given the $400 million commitment to HP. McMullan rejected that theory: "Our customers will choose."

HP's PA-RISC stations are perceived as the price/performance leader among Unix workstation makers, said Pratt, computer services director at Mineral Area College in Flat River, Mo. "CADDS-5 should run pretty darn fast on HP."

Prime is doing what a good software vendor should do: getting its packages on as many hardware platforms as it can, according to Bill Sines, director of midrange strategies at Technology Investment Strategies Corp., a market research firm in Framingham, Mass.

"It's a good deal," Sines said. HP gets another outlet for its hardware, and Prime gets more hardware for its software, according to Sines.

IBM and DEC drenched in red ink

CONTINUED FROM PAGE 1

recession and greater-than-expected economic weakness in Europe and Asia would take its toll during the fourth quarter and leave little room for a substantial pickup before the second half of 1992.

Sympathy for vendors

Both IBM and DEC users, many of whom are themselves whipsawed between a recession that won't end and competition that won't stop, voiced fellow-feeling for vendors caught in the same bind.

Analysts took particular comfort from the fact that both firms owe their battered bottom lines partly to huge quarterly charges taken in connection with massive corporate reorganizations and product-line turnarounds currently under way — in IBM's case, a whopping $3.4 billion.

"Whatever happens with the economy, IBM's 1992 numbers are bound to look good in the year-over-year comparison" to the depleted 1991 report, Weil said.

Users, looking to the fruits of the costly labors, were even more upbeat.

"IBM's certainly been trying to become a more nimble competitor. The important thing is that they are making the difficult decisions, and I applaud that," said Jack Cooper, chief information officer at Joseph E. Seagram & Sons, Inc. in New York.

Numbers for IBM's bloodied fourth quarter — the quarter that has traditionally been a bulwark for the company — came in below Wall Street's most conservative estimates.

> "I'M NOT SURPRISED, just relieved. I'm glad to bury 1991 — and so, I suspect, is [IBM Chairman] John Akers."
>
> STEPHEN DUBE
> SHERWOOD RESEARCH GROUP

The firm also reported an annual loss of $2.8 billion, on revenue down 6.1% to $64.8 billion — the first full-year IBM revenue slide since 1946 and the first annual loss ever.

In other years, analysts said, that might have been dismaying; given 1991, said Stephen Dube at Sherwood Research Group, "I'm not surprised, just relieved. I'm glad to bury 1991 — and so, I suspect, is [IBM Chairman] John Akers."

DEC Chairman Kenneth H. Olsen could no doubt be counted in on that sentiment. In line with Wall Street predictions, DEC posted a $138.3 million loss for its fiscal second quarter, ended Dec. 28 — a sharp contrast to the $111.14 million profit posted for the comparable quarter a year ago. Quarterly revenue of $3.48 billion marked a 4% increase from last year's fourth-quarter sales figure.

DEC's senior vice president of operations, John J. Smith, said the company will take a "conservative posture" for an indefinite period of time. Continued cost-containment measures, he said, will likely include new rounds of work force cuts.

While Smith would not quantify potential layoffs at DEC, analysts' estimates last week ranged between 15,000 and 20,000.

Senior Writer Sally Cusack contributed to this story.

NEWS SHORTS

Microsoft's earnings glow

Microsoft Corp. reported revenue of $682 million for the second quarter of its fiscal 1992, which ended Dec. 31 — a 48% increase over the $461 million earned in the same period a year ago. Revenue for the six months ended Dec. 31 were $1.3 billion, 52% over the $830 million recorded for the same period in fiscal 1991. Net income for the quarter was $175 million, an increase of 55% over the $133 million for the same period last year. Earnings were 90 cents per share for the second quarter and $1.65 for the six months, compared with 61 cents and $1.08 for the corresponding periods in 1991.

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Apple cops kudos, earnings boost

Apple Computer, Inc. reported better than expected earnings for 1992's fiscal first quarter. Profits topped $166 million, up 10% compared with $150.5 million for the same quarter last year. Strong sales of its Powerbook portable computer reportedly helped drive revenue up 11% from $1.68 billion in 1991's first quarter to $1.86 billion. Apple also ranked first in personal computer user satisfaction, according to a J. D. Power and Associates survey of 4,000 sites worldwide.

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ISDN deployment clarified

Livingston, N.J.-based Bellcore has released a $103 report detailing the various telephone companies' deployment plans for Integrated Services Digital Network (ISDN) service. The document compiles regional company projections for the area codes and telephone exchanges they plan to equip with ISDN access lines during the next three years. An estimated 62 million nationwide ISDN-accessible telephone lines are expected to be available by the end of 1994.

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New Symmetry processors on way

Sequent Computer Systems, Inc. is expected to announce a new series of Symmetry processors today, along with a new four-channel disk-drive controller. Sequent will also announce that its machines have been chosen as OSF/1 reference platforms by the Open Software Foundation (OSF), Sequent sources said. The new hardware systems, based on the 50-MHz Intel Corp. I486 chip, will include versions with six, 10 and 30 processors. Prices will range from $50,000 to $2.5 million.

....

Amdahl 6390 delivery set

Amdahl Corp. said it will deliver a high-capacity version of its Amdahl 6390 disk drive sometime in the fourth quarter. The firm also confirmed that shipments of the original 6390 — which has been delayed for months — had begun in late November. Several hundred have been shipped to date. The 6390 drives store about 30G bytes of data; the high-capacity models will store about 45G bytes per 16-platter disk drive. Prices will range from $128,700 (7.5G bytes) to $457,950 (45G bytes).

....

Transarc's DCE tool kit to ship

Transarc Corp. unveiled a Distributed Computing Environment (DCE) developer's kit last week that will ship in March for Sun Microsystems, Inc. and IBM RISC System/6000 Unix workstations. The kit includes core components for early application development in the OSF's DCE, an enabling technology for developing distributed computing applications to industry standards.

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Intergraph updates Clipper

Intergraph Corp. updated its Clipper line of workstations and servers last week with a new reduced instruction set computing processor said to deliver three to six times the performance of the current line. The Series 2400 desktop and Series 6400 deskside workstations and servers reportedly offer 33 Specmarks of performance and will be available in March. Prices range from $18,500 to more than $100,000, with server prices starting at $13,900.

Integrated net control tools bow

BY ELISABETH HORWITT
CW STAFF

If this month is any indication, 1992 will be the year that vendors provide the applications and other tools needed to put multivendor network management within the grasp of nontechnical users.

Steve Bortnyk, head of network management at Metropolitan Life Insurance Co., spoke for a number of users when he expressed a wish to take his favorite network management applications and mesh them with the multivendor nature of an integrated network management platform.

Recent and upcoming announcements are beginning to address growing user frustration with the limitations of today's multivendor network management systems. Such systems provide utilities for collecting and displaying alerts from a variety of devices but are weak on applications that help nontechnical users analyze, correlate and respond to the data collected.

Last week, Synoptics Communications, Inc. announced Lattisware, a series of Simple Network Management Protocol (SNMP)-based applications designed to manage both its own and other vendors' local-area network connectivity devices.

"Applications are exactly what we're looking for," said Chris Yates, head of telecommunications at UK utility National Power PLC.

"We want to quickly start conditioning our operators to work with users and take a more overall systems approach to network management, [instead of just] fixing individual components," he added.

National Power, a Synoptics hub user, is evaluating the vendor's new Trendware package as a way to monitor performance across the power utility's Synoptics hubs and Cisco Systems, Inc. routers, Yates said.

Unfortunately, the initial Lattisware releases have "limited scope for users to write in their own filters, to produce reports covering a lot of network indicators," he added. Synoptics said future releases will be far more tailorable by users.

This week, Hewlett-Packard Co. is expected to announce Openview Extensible SNMP Agent software, which is said to include 60 preprogrammed "objects" that deliver a variety of information about HP-UX and Sun Microsystems, Inc. SunOS servers and workstations.

"This is the first time I've seen a real systems management approach for SNMP," said Frank Dzubeck, president of consulting firm Communications Network Architects, Inc. in Washington, D.C. However, HP's system "is not a one-minute manager for you or me," Dzubeck said. "You have to [understand the] concept of an SNMP management information base to run this — it isn't for the inexperienced person yet."

At next week's Communication Networks Conference and Exposition '92, however, HP is expected to showcase some 40 third-party applications for Openview. One new HP partner, Isicad, Inc., will unveil a link between Openview and its graphics-based configuration management system, Command.

HP partner Peregrine Systems, Inc. is also expected to unveil an interface between its Peregrine Network Management System (PNMS) and HP's Openview. Peregrine will announce a multivendor, client/server version of PNMS and Sonoma, software that allows Openview to manage IBM Systems Network Architecture networks, a company spokesman said.

Also this week, IBM is expected to announce Netview/6000, its long-awaited SNMP-based Ethernet LAN management workstation, as well as its multiprotocol router. One source who has seen the product said, "It's a step in the right direction" toward providing a truly friendly management system to users.

Meanwhile, Cabletron Systems, Inc. and Cisco have both announced that they will provide IBM's Netview with SNMP management capabilities through their respective network management systems.

Cisco's interface between its Netcentral software and Netview is scheduled to ship in March, priced at $3,500.

Cabletron announced that its Spectrum will interface with both Netview and System Center's Net/Master over a "built-in SNA gateway" priced at $2,995.

Applications arrive

▶ *Synoptics' Lattisware:*
Systems managed: SNMP-compatible network devices; Synoptics hubs
Platforms: Unix, DOS
Applications: Fault management, trouble ticketing, performance monitoring, network administration
Availability: Second-quarter 1992
Price: $995 to $12,995

▶ *Hewlett-Packard's Openview Extensible SNMP Agent:*
Systems managed, platforms: HP-UX, Sun Sparcstations and servers
Applications: Monitoring of health and usage levels of databases, attached peripherals, CPUs and applications. Threshold setting, automatic response to events.
Availability: Now
Price: $1,000 per agent

▶ *Systems Center, Inc.'s Net/Master:*
Systems managed: IBM SNA, Unix, LANs, routers
Platform: IBM hosts, others to come
Applications: Problem, change, configuration, inventory, and asset management
Availability, price: N/A

▶ *Peregrine Systems, Inc. client/server PNMS*
Systems managed: Unix, MVS, multivendor networks, LANs
Platforms: IBM MVS, Unix database servers, Apple Computer, Inc. Macintosh, DOS clients
Applications: Problem, change, inventory/configuration and financial management
Availability: March or April
Price: N/A

Bush visits Cabletron

Gamma Liaison

President Bush inspects *manufacturing facilities at leading smart-hub firm Cabletron Systems, Inc. in Rochester, N.H., during his preprimary tour last week. Cabletron Chairman Craig Benson (right) and President S. Robert Levine took the opportunity to announce plans to hire 200 and build an engineering facility in Merrimack, N.H.*

BASF tape exchange gets mixed reviews

CONTINUED FROM PAGE 1

BASF is replacing the tapes at its own cost and has been notifying users through its sales force. He also would not commit to a date when the suspect or bad cartridges would be completely replaced for all customers.

"We've notified everyone we can, and the problem is pretty much under control. We're replacing cartridges within customers' schedules of when they need them," Healion said. To help meet demand, he said, BASF is obtaining 20% of its total capacity from competitors. He acknowledged, however, that some customers that purchased their tapes from wholesalers or other third parties may not have been notified.

Some BASF customers said they are dissatisfied with the pace of cartridge replacement.

Users of the faulty tapes, contacted last week, reported no loss of data but said operations have been disrupted because jobs fail or abort when data cannot be read from the tapes until the debris is cleaned from the drives. Another operations disruption comes, users said, when the data from the old tapes has to be copied onto new ones.

BASF is getting mixed reviews so far on its response to the problem.

"We first found the problem about 18 months ago," said the computer facilities manager of a Midwestern insurance company. "At first, we thought it was a tape drive problem. The drive's manufacturer replaced the read/write heads at its own expense several times before we realized that it was the BASF cartridges. BASF came in during late 1990 and promised to replace 47,000 cartridges. We waited four months before we got any, and we've only gotten 6,000 new ones so far," he said.

BASF reneged on a promise to make several large shipments of replacement tapes and is instead shipping 2,000 tapes a week, he added. "At this rate, it will take the whole year to fix the problem."

His shop also has an additional 30,000 BASF cartridges that have not yet exhibited problems but which may eventually need to be replaced.

Other customers laud BASF for taking care of business promptly. "We weren't having any problems, but BASF came in and told us that we may have some bad tapes and that they wanted to replace them free of charge," said David Moore, senior vice president at Mellon Bank Corp. in Pittsburgh. BASF has swapped about 90% of Mellon's 70,000 cartridges.

"They've been very good about stepping up to the problem and resolving it," Moore said. As a preventive measure, he added, Mellon has instituted a program to wet-clean its tape drives at regular intervals.

John J. Alexander, senior vice president at Unum Life Insurance Company of America, Inc. in Portland, Maine, also said he is satisfied with how BASF resolved the problem. "We have absolutely no complaints. We'd much rather the problem didn't happen, but being that it did, they were very customer-focused and worked with us to get the data off the bad tapes."

The worst seems to be over for most users. Larry J. Martin, vice president of Pound Ridge, N.Y.-based Reliability Research, Inc., which tracks statistics about tape drives, said that for the last two months, only a handful of new BASF-related incidents have been reported.

"All our tests say categorically that the debris stays on the head and does not go anywhere," Healion explained. The reason it took so long for the problem to become apparent, he added, is that the debris' buildup depends on how much the faulty tape is used. Despite rumors to the contrary, the problem is not industrywide, sources said.

This Bud's for Washington

BY CLINTON WILDER
CW STAFF

STUDIO CITY, Calif. — Forget Jim Kelly's golden arm, Thurman Thomas' elusive moves and the "we-just-missed-last-year" motivation factor. The Washington Redskins will shut down the Buffalo Bills and easily win Super Bowl XXIV by more than a touchdown.

So predicted Bud Goode, the veteran National Football League statistics maven who crunches game numbers on his Intel Corp. 80386-based IBM clone with 8M bytes of memory and a 387 math coprocessor. Goode built a statistics application based on BMDP 386, from BMDP. He also uses a data compression program called Stacker by Stack that doubles database capacity.

Despite Buffalo's impressive dominance of the American Football Conference (AFC) this year, the Bills do not rate well in Goode's book because of their inconsistent defense.

According to Goode, the key to Super Bowl victory is controlling the clock — sustaining long drives on offense while consistently stopping the other team on third downs or with turnovers. Statistically, Washington's defense rates far better than Buffalo's — which led Goode to predict a nine-point Redskin victory Sunday in Minneapolis. (The official point spread at press time was Washington by seven.)

"If the Bills' weak defense against the run holds true to form, Kelly will never see the ball," Goode said.

Goode crunches a multitude of stats throughout the season and publishes a weekly analysis in *The New York Times* of Jets and Giants games. On the clock control statistic, the Redskins ranked fifth in the league by controlling the ball an average of 31.9 minutes per game, while the Bills ranked dead last with only 26.1 minutes of possession per game.

On the defensive side, the difference becomes even more glaring. Goode's key defensive stat is the number of opponents' rushes and pass completions allowed per game because those are the plays that keep drives alive and the clock moving. The Skins allowed an average of 40 such plays by each of their opponents, putting them third in the league. The Bills allowed 51 — dead last again.

But what about the Bill's overpowering defensive performance in the AFC championship game, shutting out the Broncos until the final moments?

"That's a good sign that they've patched their defense," Goode said, "but I'm not sure they've played a team with an offense like Washington's."

Killing time

The team that holds on to the ball the longest will probably win the Super Bowl. That means Washington will win, based on time of possession achieved during the regular season

BUFFALO BILLS	Bills' time of possession (minutes)	**WASHINGTON REDSKINS**	Skins' time of possession (minutes)
Miami Dolphins	**29.0**	Detroit Lions	**36.5**
Pittsburgh Steelers	**33.1**	Dallas Cowboys	**31.4**
New York Jets	**19.4**	Phoenix Cardinals	**33.6**
Tampa Bay Buccaneers	**20.8**	Cincinnati Bengals	**32.2**
Chicago Bears	**25.2**	Philadelphia Eagles	**38.7**
Kansas City Chiefs	**15.9**	Chicago Bears	**27.6**
Indianapolis Colts	**25.2**	Cleveland Browns	**28.5**
Cincinnati Bengals	**22.7**	New York Giants	**28.8**
New England Patriots	**29.5**	Houston Oilers	**34.8**
Green Bay Packers	**28.4**	Atlanta Falcons	**34.3**
Miami Dolphins	**35.4**	Pittsburgh Steelers	**37.8**
New England Patriots	**25.9**	Dallas Cowboys	**21.4**
New York Jets	**24.4**	Los Angeles Rams	**27.9**
Los Angeles Raiders	**25.5**	Phoenix Cardinals	**33.6**
Indianapolis Colts	**26.2**	New York Giants	**28.6**
Detroit Lions	**30.6**	Philadelphia Eagles	**34.6**
Season average	**26.1**	Season average	**31.9**
WIN		**LOSS**	

Source: Bud Goode Sports Computer

NFL gets 20/20 vision for analysis, strategy

BY CAROL HILDEBRAND
CW STAFF

OK, so a spreadsheet may not help your team battle downfield to the one-yard line with 50 seconds on the clock. And it won't be there when the quarterback jubilantly spikes the ball in the end zone. But it can help on the business end of the gridiron.

The National Football League's (NFL) information processing department uses Computer Associates International, Inc.'s 20/20 spreadsheet for a variety of applications, ranging from financial analysis to tracking contracts.

A nationwide network of an assortment of Digital Equipment Corp. machines ranging from Microvaxes to 3900s running DEC's All-In-1 office software, prompted the NFL to standardize on 20/20.

The package had several attractions, said Mary Oliveti, manager of information processing for the NFL: its networkability, its compatibility with All-In-1 and the fact that it resembles another package used by NFL teams, Lotus Development Corp.'s 1-2-3.

"Because it is integrated with All-In-1, we can mail spreadsheets and spreadsheet formats across the network," she said.

However, 20/20 is used for more than standard business applications. John Burger, the computer coordinator for the New York Giants, has compiled records using the spreadsheet on each player and game played. He also uses it to generate a quarterback rating system.

Over in Minnesota, Mike Eayrs, the Vikings' director of research and development, takes advantage of 20/20 to help analyze opponents' plays and deduce strategy from there.

Bruce Dierdorff/NFL photos

Plays, players, finances *and more: The NFL and some of its teams chose the CA spreadsheet to use on their DEC computers*

Patience with CA runs short

CONTINUED FROM PAGE 1

with a giant budget increase. That doesn't play well."

- Extra license fees imposed by CA in the course of a data center consolidation have cost one manufacturing customer of both CA and EDS "multiple hundreds of thousands of dollars," said the firm's IS director who asked not to be named.

If the recession rolls back before CA backs off, aggrieved users — outsourcing vendors and otherwise — will be ready to bail out, observers said.

"We told CA they've got us, short term — but we're not going to take this forever," said Dudziak, an avowed CA booster of technology and IS strategy.

CA's reputed charging of huge software license transfer fees when outsourcing vendors take over an IS department is causing a minor furor in the outsourcing sector, said Melvyn Bergstein, a former executive at Computer Sciences Corp. who is vice chairman at TSC Co., a systems integrator in Chicago. "It creates a lot of uncertainty and really makes the economics [of outsourcing] difficult."

In a huge IS shop for instance, license transfer costs "can go as high as $500,000," Bergstein said, harking back to his experience as an outsourcing executive.

Beyond an earlier prepared release, CA was unable to comment on any matters related to the EDS lawsuit.

Users said they sympathized with the concerns of software vendors, who see the shift to desktop computing eroding their traditional revenue base and who feel further threatened as hardware vendors look increasingly to software for growth. But sympathy has its limits, said Tom Reinhardt, director of cable information services at United Artists Entertainment, Inc. in Los Angeles.

When software vendors — and CA is far from the only one, Reinhardt said — "see users getting bigger, even though their use remains the same, and say 'Hey, I want a piece of that action' — well, I have a little problem with that."

Brush Wellman — which, having seen CA acquire three former software suppliers in the same number of years, has become its "strategic partner by default" — harbors conflicted feelings toward its vendor, Dudziak said. "I have absolutely bought into their 'CA '90s' concept," he said. "Their product strategy fits right in with our strategy to go down the client/server path. We're ready to go all the way down the line with them, and from most points of view we're really happy to do it. But we've got this one major bone of contention: pricing."

Senior Editor Clinton Wilder contributed to this report.

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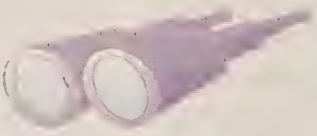
WYSIWYG

The waiting game

Next time you have to justify a text-retrieval, E-mail or customer-service information system, remember this:

Over a lifetime, the average American will spend one year searching for misplaced items, two years returning business phone calls and five years standing in line.

How to spot your CEO



You can tell he's a CEO if he:

- Has a computer on the credenza but didn't want those ugly wires in the back.
- Doesn't know what his company's product does or how the technology works but is adamant about its superiority.
- Owns the Top Five word processors but is afraid of losing his executive status if he touches a keyboard.
- Wonders why he can't get FNN on the network cable.

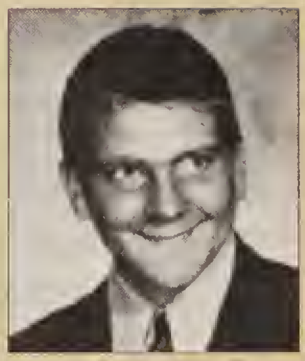
Rube Goldberg woulda been proud

Part of the explanation offered by PR firm Technopolis Communications about why Pacific Bell created a new area code in Los Angeles:

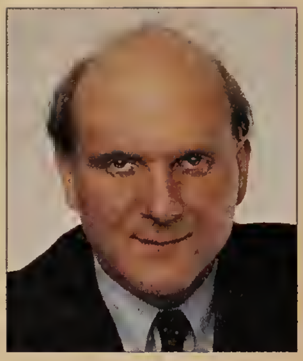
All the car phones called
the answering machines,
which dialed into voice mail,
then transmitted by modem
to beep the pagers
that forwarded the calls via E-mail
to fax the message heard 'round L.A.:
"Let's do lunch."

Sources: Consultech Communications, Inc.; Gehrung Associates, Inc.; World Future Society's "Outlook '92" report; *Federal Computer Week*; Runzheimer International

PHOTO GALLERY



Steve Ballmer
Detroit Country
Day high school, 11th grade
Member, computer club



Steve Ballmer
Senior VP, software
Microsoft Corp.

Overheard at a DECUS meeting:

"Systems should be measured in BTUs. Not British Thermal Units but in how many times you can Blame The User."

LAST WRITES

Alan Olinsky, a professor at Rhode Island's Bryant College, is computerizing the records of the Swan Point Cemetery in East Providence, R.I. As he transferred the information from some 70,000 Rolodex cards to the database, he ran across the record of a man from the 1890s whose card read simply: "Cause of death — shot by Joe Smith."

WYSIWYG design by Michael Siggins

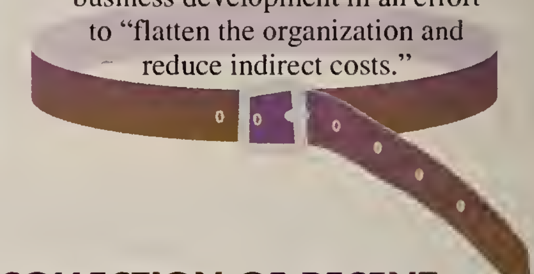
Reader file

We are a small credit company. We send a lot of $5\frac{1}{4}$- or $3\frac{1}{2}$-in. disks out to our users with credit information. Recently, we mistakenly sent out a $5\frac{1}{4}$-in. disk to someone who needed a $3\frac{1}{2}$-in. When the user sent us back the wrong disk, we noticed the package it came in was rather bulky. It turned out that the user had sent us back the $5\frac{1}{4}$-in. disk folded in half; apparently, the user had fit the disk into a $3\frac{1}{2}$-in. disk drive.

Eddie Russell, MIS manager, San Diego, Calif.

Lean and mean is in, but isn't this going a bit far?

Technology Applications, Inc., an Alexandria, Va., systems integrator, fired the company president, chief scientist and the vice president of business development in an effort to "flatten the organization and reduce indirect costs."



A COLLECTION OF RECENT PREDICTIONS BY FUTURISTS

- By the year 2000, AI systems will affect 60% to 90% of the jobs in large organizations by augmenting, downgrading or displacing workers.
- Telephones that instantly translate foreign languages may emerge within the next 20 years.
- Video cameras the size of a postage stamp (using image sensors on a silicon chip) could be manufactured for less than $50 by the year 2000. They could become the "eyes" of robots.

Do you have anecdotes about your users, your boss or your job? Know any industry trivia? If so, please contact Lory Zottola or Jodie Naze at (800) 343-6474.
If we use your ideas, we'll send you a gift.

INSIDE LINES

Seeking a pot o' gold

▶ DEC is said to be engaged in a serious internal struggle over refinements to its second entry into the PC market. DEC's Ken Olsen reportedly is considering two options: one, to buy PCs from a small unidentified Taiwanese manufacturer; the other, to build a line of its own from a plant in Arizona. The DEC-manufactured line would have 16 models, based on 386 chips from Advanced Micro Devices and I486 chips from Intel. The systems would be modular and "aggressively priced," a source said. Another source said DEC might decide to integrate the two strategies. Look for clarity in the not-so-distant month of April.

What's Next?

▶ Next Chairman Steve Jobs will use his keynote speech at this week's Nextworld in San Francisco to announce that the Nextstep operating system will be rewritten to allow it to run on PCs powered by Intel I486 chips. That means the updated program, which is due this summer, will be able to work with millions of IBM and IBM-compatible machines, making it attractive for PC owners to integrate Next into their offices.

Macwindows multimedia

▶ Apple CEO John Sculley said at last week's Macworld Expo in San Francisco that his firm is "exploring the possibility" of releasing a version of its Quicktime 1.0 multimedia operating system extension that will work on computers running Microsoft's Windows. Sculley did not, however, give a timetable for such a release.

Synergistic urges

▶ Data General is about to beef up the number of financial and human resources applications available for its RISC-based Aviion line at Uniforum in San Francisco this week. DG reportedly is teaming up with Dun & Bradstreet to port a crop of packages to Aviion boxes. The deal would fill a "paucity" of financial software inhibiting Aviion users and help relieve D&B's reliance on the mainframe market, one source said.

Staying active

▶ The only way to get a portable with an active matrix screen is to a buy a heavy AC-powered system. Toshiba America Information Systems will lighten the load when it introduces two portables today, one based on a 33-MHz I486DX, the other a 25-MHz 486SX machine. Prices will range from $5,699 for the T6400SX with gas plasma screen and a 120M-byte hard drive to $9,749 for the active-matrix T6400DXC with a 486/33 and a 200M-byte hard drive. Toshiba expects to ship in mid-February. These products will supplant Toshiba's existing T3200SX and T5200 products.

Waiting for the paperwork

▶ Stung by delays in shipping its System 3600 computer, NCR had hoped to announce this week at Uniforum a handful of beta customers for its high-end, microprocessor-based System 3600 computer. But the customer releases didn't come through in time for the show, so NCR had to settle for other planned announcements, including a partnership with Procase Corp., which will port its CASE tools to the System 3000 platform.

The recent revelation that a virus was used to attack an Iraqi air defense computer in the weeks before the Persian Gulf war is more fanciful than factual, according to virus experts. U.S. intelligence agents intercepted a printer destined for an Iraqi air defense mainframe and replaced a chip with one containing a virus, according to an article in U.S. News and World Report *two weeks ago. The virus supposedly caused information on screen to vanish. "Nonsense," several virus busters said, adding a virus located in a printer could not impact a mainframe. The news account closely mirrors an April Fool's Day column in* Infoworld *last year that detailed a similar plot. "The coincidence is eerie, but our account is accurate," an assistant managing editor at* U.S. News and World Report *said. Have any eerie coincidences to report? Phone, fax or Compuserve them to our News Editor, Alan Alper, at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively.*

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